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EAL AND SALMON FISHERIES

AND

GENERAL RESOURCES

OF

ALASKA.

IN FOUR VOLUMES.

VOLUME III.

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1898.

REPORTS BY H. W. ELLIOTT AND LIEUT. WASHBURN MAYNARD, U. S. N., ON THE FUR-SEAL FISHERIES, ETC., OF THE PRIBILOF ISLANDS, AND BY REV. SHELDON JACKSON ON "REINDEER IN ALASKA" AND "EDUCATION IN ALASKA,"

WITH

COMMENTS ON ELLIOTT'S AND MAYNARD'S REPORTS

BY

DAVID STARR JORDAN.

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[FROM THE REPORT IN THE TENTH CENSUS.]

REPORT

ON

THE SEAL ISLANDS OF ALASKA.

By HENRY W. ELLIOTT.

LETTER OF TRANSMITTAL.

SMITHSONIAN INSTITUTION, *March 31, 1880.*

DEAR SIR: At the suggestion of Professor Baird and Mr. Goode, I have taken much pleasure in rewriting my field notes made upon the Seal Islands of Alaska, which I herewith inclose for the use of the Census Office, now under your direction. I also embody those maps and drawings which I think necessary to give the reader a better idea of my understanding of the subject.

Very respectfully, your friend and servant,

HENRY W. ELLIOTT.

Hon. FRANCIS A. WALKER,
Superintendent Tenth Census.

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THE SEAL ISLANDS OF ALASKA.

By HENRY W. ELLIOTT.

HISTORY AND OBJECTS OF THE MEMOIR.

THE WRITER'S OPPORTUNITIES FOR OBSERVATION.—During the progress of the heated controversies that took place pending the negotiation which ended in the acquisition of Alaska by our Government frequent references were made to the fur seal. Strange to say, this animal was so vaguely known at that time, even to scientific men, that it was almost without representation in any of the best zoological collections of the world. Even the Smithsonian Institution did not possess a perfect skin and skeleton. The writer, then, as now, an associate and collaborator of this establishment, had his curiosity very much excited by those stories, and in March, 1872, he was, by the joint action of Professor Baird and the Secretary of the Treasury, enabled to visit the Pribilof Islands for the purpose of studying the life and habits of these animals.

The fact is, that the acquisition of those pelagic peltries had engaged thousands of men, and that millions of dollars have been employed in capturing, dressing, and selling fur-seal skins during the hundred years just passed by; yet, from the time of Steller, away back as far as 1751, up to the beginning of the last decade, the scientific world actually knew nothing definite in regard to the life history of this valuable animal. The truth connected with the life of the fur seal, as it herds in countless myriads on the Pribilof Islands of Alaska, is far stranger than fiction. Perhaps the existing ignorance has been caused by confounding the hair seal, *Phoca vitulina*, and its kind, with the creature now under discussion. Two animals more dissimilar in their individuality and method of living can, however, hardly be imagined, although they belong to the same group, and live apparently upon the same food.

The notes, surveys, and hypotheses herewith presented are founded upon the writer's personal observations in the seal rookeries of St. Paul and St. George during the seasons of 1872 to 1874, inclusive, supplemented by his confirmatory inspection made in 1876. They were obtained through long days and nights of consecutive observation, from the beginning to the close of each seal season, and cover, by actual surveys, the entire ground occupied by these animals. They have slumbered in the author's portfolio until the present moment, simply for the reason that he desired, before making a final presentation of the history of these islands and the life thereon, to visit the Russian seal islands, the "Commanders," viz, Bering and Copper islands, which lie to the westward, 700 miles from our own, and are within the pale of the Czar's dominion.

PREVIOUS OBSERVATIONS OF STELLER AND OTHERS.—In treating this subject the writer has trusted to nothing save what he himself has seen; for until these life studies were made by him no succinct and consecutive history of the lives and movements of these animals had been published by any man. Fanciful yarns, woven by the ingenuity of whaling captains, in which the truth was easily blended with that which was not true, and short paragraphs, penned hastily by naturalists of more or less repute, formed the knowledge that we had. Best of all was the old diary of Steller, who, while suffering bodily tortures, the legacy of gangrene and scurvy, when wrecked with Vitus Bering on the Commander Islands, showed the nerve, the interest, and the energy of a true naturalist. He daily crept, with aching bones and watery eyes, over the bowlders and mossy flats of Bering Island, to catch glimpses of those strange animals which abode there then as they abide to-day. Considering the physical difficulties that environed Steller, the notes made by him on the sea bears of the North Pacific are remarkably good; but, as I have said, they fail so far from giving a fair and adequate idea of what these immense herds are and do as to be absolutely valueless for the present hour. Shortly after Steller's time great activity sprang up in the South Atlantic and Pacific over the capture and sale of fur-seal skins taken in those localities. It is extraordinary, that though whole fleets of American, English, French, Dutch, and Portuguese vessels engaged, during a period of protracted enterprise of over eighty years in length, in the business of repairing to the numerous rookeries of the Antarctic, returning annually laden with enormous cargoes of fur-seal skins, yet, as above mentioned, hardly a definite line of record has been made in regard to the whole transaction, involving, as it did, so much labor and so much capital.

FORMER PUBLICATIONS OF THE WRITER.—A brief digest of the writer's notes, relating principally to the business on the islands, was prepared and given to the Treasury Department in 1873–74. This was printed by the Secretary and has been the text of guidance, as to observation, employed by the agents of the Government ever since. The maps and sketch maps are herewith accordingly given to the public for the first time. The author, fearing that private and personal affairs which now confine him may possibly never permit his going over to the Asiatic rookeries, thinks it perhaps better that what he now knows definitely in regard to the matter should be published without longer delay.

It was with peculiar pleasure that the writer undertook, at the suggestion of Professor Baird, who is the honored and beloved secretary of the Smithsonian Institution, the task of examining into and reporting upon this subject; and it is also gratifying to add that the statements of fact and the hypotheses evolved therefrom by him in 1874 have, up to the present time, been verified by the inflexible sequence of events on the ground itself. The concurrent testimony of the numerous agents of the Treasury Department and the Government generally, who have trodden in his footsteps, amply testifies to their stability. (See note, 39, A.)

GEOGRAPHICAL DISTRIBUTION OF THE FUR SEAL.

PECULIARITIES OF DISTRIBUTION.—Our first thought in studying the distribution of the fur seals throughout the high seas of the earth is one of wonder. While they are so widely spread over the Antarctic regions, yet, as we pass the equator going north, we find in the Atlantic

above the tropics nothing that resembles them. Their range in the North Pacific is virtually confined to four islands in Bering Sea, namely, St. Paul and St. George of the tiny Pribilof group, and Bering and Copper of the Commander Islands, large in area, but relatively scant in seal life.

The remarkable discrepancy which we have alluded to may be better understood when we consider that these animals require certain conditions of landing and breeding ground and climate, all combined, for their perfect life and reproduction. In the North Atlantic no suitable territory for their reception exists or ever did exist; and really nothing in the North Pacific beyond what we have designated in Bering Sea will answer the requirements of the fur seal. When we look over the Antarctic waters, we are surprised at what might have been done, and should have been done, in those southern oceans. There we find hundreds of miles of the finest seal-breeding grounds on the western coast of Patagonia, the beautiful reaches of the Falkland Islands, the great extent of Desolation Island, together with the whole host of smaller islets, where these animals abounded in almost countless numbers when first discovered, and should abound to-day—millions upon millions—but which have been, through nearly a century, the victims of indiscriminate slaughter, directed by most unscrupulous and most energetic men. It seems well-nigh incredible, but it is true, nevertheless, that for more than fifty years a large fleet, numbering more than sixty sail and carrying thousands of active men, traversed this coast and circumnavigated every island and islet, annually slaughtering right and left wherever the seal life was found. Ships were laden to the water's edge with the fresh, air-dried, and salted skins, and they were swallowed up in the marts of the world, bringing mere nominal prices—the markets glutted, but the butchery never stopping.

THE SEAL GROUNDS IN THE SOUTHERN HEMISPHERE.—I will pass in brief review the seal grounds of the Southern Hemisphere. The Galapagos Islands come first in our purview. This scattered group of small rocks and islets, uninhabited and entirely arid, was fifty years ago resorted to by a very considerable number of these animals, *Arctocephalus australis*, together with many sea lions, *Otaria hookeri*. Great numbers were then captured by fur sealers, who found to their sorrow when the skins were inspected that pelage was poor and worthless. A few survivors, however, remain to this day.

Along and off the coast of Chile and Bolivia are the St. Felix and Juan Fernandez islands, the latter place being one of the most celebrated rookeries known to Antarctic sealers. The west coast of Patagonia and a portion of that of Terra del Fuego was in those early days of seal hunting, and is to-day, the finest connected range of seal-rookery ground in the south. Here was annually made the concentrated attack of that sealing fleet referred to; and one can readily understand how thorough must have been the labor, as he studies the great extent and deep indentation of this coast, its thousand and one islands and islets, and when he sees to-day that there is scarcely a rookery of fur seals known to exist there. The Falkland Islands, just abreast of the Straits of Magellan, were also celebrated, and a favorite resort, not only of the sealers, but of the whale fleets of the world. They are recorded, in the brief mention made by the best authority, as fairly swarming with fur seals when they were opened up by Captain Cook. There is to-day, in the place of the millions that once existed, an insignificant number, taken notice of only now and then.

The Georgia Islands and the Sandwich group—all a succession of rocky islands and reefs awash—the South Orkneys, the Shetlands, the Auckland group, Campbells Island, Emerald Island, and a few islets lying just to the southward of New Zealand, have all been places of lively and continued butchery; the fur seals ranging in desperation from one of those places to the other as the seasons progressed, and the merciless search and slaughter continued. These pinnipeds, however, never went to the southward of 62° south latitude.

In considering the western Antarctic hemisphere, I must not forget also to mention that the fur seal was in early times found up the east coast of South America, here and there in little rookeries, as far north as Cape St. Roque; but the number was unimportant when brought into contrast with that belonging to those localities which I have designated. A small cliff-bound rookery to-day exists at Cape Corientes. This is owned and farmed out by Argentina, and we are informed that in spite of all their care and attention they have neither increased nor have they diminished from their original insignificance; from this rookery only 3,000 to 5,000 were and are annually taken. It appears as if the fur seals had originally passed to Bering Sea from the parent stock of the Patagonia region, up along the coast of South America, a few tarrying at the dry and heated Galapagos Islands, the rest speeding on to the northward, disturbed by the clear skies and sandy beaches of the Mexican coast, on and up to the great fish-spawning shores of the Aleutian Islands and Bering Sea. There, on the Pribilof group and the bluffy Commander Islands, they found that union of cool water, well-adapted landing, and moist, foggy air which they had missed since they left the storm-beaten coasts far below.

In the Antarctic waters of the Eastern Hemisphere seals were found at Tristan da Cunha, principally on Little Nightingale Island, to the southward of it; on Goughs Island; on Bouvets Island; Prince Edward and Marion islands; the Crozette group, all small rocks, as it were, over which violent storms fairly swept; then we observe the great rookeries of Kerguelen Land, or Desolation Island—where perhaps nine-tenths of all the oriental fur seals congregated—thence over to a small and insignificant islet known as the Royal Company, south of Good Hope. This list includes all the known resting places of the fur seal in those waters.

FORMER ABUNDANCE IN THE SOUTHERN HEMISPHERE; EXTENT OF EXTERMINATIONS.—In the light of the foregoing remarks, is it not natural, when we reflect upon the immense area and the exceedingly favored conditions of ground and climate frequented by the fur seals of the southern ocean, to say that their number must have been infinitely greater as they were first apprehended, surpassing all adequate description, when compared to those which we now regard as the marvel and wonder of the age—the breeding rookeries of the Pribilof group?

It is a great pity that this work of extermination and senseless destruction should have progressed as it has to the very verge of total extinction ere anyone was qualified to take note of and record the wonderful life thus eliminated. The Falkland Islands and Kerguelen Land, at least, might have been placed under the same restrictions and wholesome direction which the Russians established in the North seas, the benefits of which accrue to us to-day, and will forever, as matters are now conducted. Certainly it is surprising that the business thought, the hardheaded sense, of those early English navigators

should not have been equal to that of the Russian Promyshleniks, who were renowned as the most unscrupulous and the greediest of gain-getters.

POSSIBILITIES FOR PROTECTION.—The Falkland Islands offer natural conditions of protection by land far superior to those found on the Pribilof or Commander groups. They have beautiful harbors and they lie in the track of commerce, advantages which are not shared by our islands. At Desolation Island, perhaps, the difficulties are insuperable on account of the great extent of coast, which is practically inaccessible to men and nearly so to the seals; but the Falkland Islands might have been farmed out by the British Government at a trifling outlay and with exceeding good result, for millions upon millions of the fur seals could rest there to-day, as they did a hundred years ago, and be there to-morrow, as our seals do and are in Bering Sea. But the work is done. There is nothing down there now valuable enough to rouse the interest of any government; still, a beginning might be made which, possibly forty or fifty years hence, would rehabilitate the scourged and desolated breeding grounds of the South seas. We are selfish people, however, and look only to the present, and it is, without question, more than likely that should any such proposition be brought before the British Parliament it would be so ridiculed and exaggerated by demagogues and ignorant jesters as to cause its speedy suppression; hence, in our opinion, it is not at all likely that the English Government, or any of the other governments controlling these many islands of the Southern ocean which we have named will ever take a single step in the right direction as far as the encouragement of the fur seal to live and prosper in those regions is concerned. When we look at our northern waters, we speedily recognize the fact that between North America and Europe, across the Atlantic and into the Arctic, there is not a single island or islet or stretch of coast that the fur seal could successfully struggle for existence on. These facts will become entirely clear when the chapter on the habit of this animal is reached.

ISOLATION OF THE NORTH PACIFIC ROOKERIES.—In the North Pacific, in prehistoric times, a legend from Spanish authority states that fur seals were tolerably abundant on the Santa Barbara and Guadaloupe islands, off the coast of California, and the peninsula to the southward. A few were annually taken from these islands up to 1835, and some were wont to sport on those celebrated rocks off the harbor of San Francisco, known as the Farralones; but no tradition locates a seal rookery anywhere else on the northwest coast, or anywhere else in all Alaska and its islands, save the Pribilof group, while across and down the Asiatic coast only the Commander Islands and a little rock[1] in the Kurile chain have been and are resorted to by them. The crafty savages of that entire region, the hairy Ainos of Japan, and the Japanese themselves, have for a hundred years searched and searched in vain for such ground.

COMMERCIAL IMPORTANCE OF THE ALASKA ROOKERIES.—To recapitulate, with the exception of these seal islands of Bering Sea, there are none elsewhere in the world of the slightest importance to-day; the vast breeding grounds bordering on the Antarctic have been, by the united efforts of all nationalities—misguided, short-sighted, and greedy of gain—entirely depopulated; only a few thousand unhappy stragglers are now to be seen throughout all that southern area, where

[1] Robbins Reef.

millions once were found, and a small rookery, protected and fostered by the government of a South American State, north and south of the mouth of the Rio de la Plata. When, therefore, we note the eagerness with which our civilization calls for seal-skin fur, the fact that, in spite of fashion and its caprices, this fur is and always will be an article of intrinsic value and in demand, the thought at once occurs that the Government is exceedingly fortunate in having this great amphibious stock yard far up and away in the quiet seclusion of Bering Sea, from which it shall draw an everlasting revenue and on which its wise regulations and its firm hand can continue the seals forever.

DISCOVERY OF THE PRIBILOF ISLANDS.

SEARCH OF RUSSIAN EXPLORERS FOR SEA OTTERS AND SEALS.—All writers on the subject of Alaskan exploration and discovery agree as to the cause of the discovery of the Pribilof Islands in the last century. It was due to the feverish anxiety of a handful of Russian fur gatherers who desired to find new fields of gain when they had exhausted those last uncovered. Altasov, and his band of Russians, Tartars, and Kossacks, arrived at Kamchatka toward the close of the seventeenth century, and they first found, of all men, the beautiful, costly, rare fur of the sea otter. The animal bearing this pelage abounded then on that coast, but by the middle of the eighteenth century they and those who came after them had entirely extirpated it from that country. Then the survivors of Bering's second voyage of observation, in 1741–42, and Tscherikov brought back an enormous number of skins from Bering Island; then Michael Novodiskov discovered Attoo, and the contiguous islands, in 1745; Paikov came after him and opened out the Fox Islands, in the same chain, during 1759; then succeeded Stepan Glotov, of infamous memory, who determined Kakiak in 1763, and the peninsula of Alaska followed in order by Krenitsin, 1768. During these long years, from the discovery of Attoo until the last date mentioned above a great many Russian associations fitted out at the mouth of the Amoor River, and the Okotsk Sea, and prospected therefrom this whole Aleutian Archipelago in search of the sea otter. There were perhaps 25 or 30 different companies, with quite a fleet of small vessels, and so energetic and thorough were they in their search and capture of the sea otter that along by 1772 and 1774 the catch in this group had dwindled down from thousands and tens of thousands at first, to hundreds and tens of hundreds at last. As all men do when they find that that which they are engaged in is failing them, a change of search and inquiry was in order, and then the fur seal, which had been noted but not valued much, every year as it went north in the spring through the passes and channels of the Aleutian chain, then going back south again in the fall, became the source of much speculation as to where it spent its time on land and how it bred. Nobody had ever heard of its stopping one solitary hour on a single rock or beach throughout all Alaska or the northwest coast. The natives, when questioned, expressed themselves as entirely ignorant, though they believed, as they believe in many things of which they have no knowledge, that these seals repaired to some unknown land in the north every summer and left every winter. They also reasoned, then, that when they left the unknown land to the north in the fall and went south into the North Pacific, they traveled to some other strange island or continent there upon which in turn to spend the winter. Naturally the Russians preferred to look for the sup-

posed winter resting places of the fur seal, and forthwith a hundred schooners and shallops sailed into storm and fog to the northward occasionally, but generally to the southward, in search of this rumored breeding ground. Indeed, if the record can be credited, the whole bent of this Russian attention and search for the fur-seal islands was devoted to that region south of the Aleutian Islands, between Japan and Oregon.

PRIBILOF'S DISCOVERY OF THE ISLANDS WHICH BEAR HIS NAME.—Hence it was not until 1786, after more than eighteen years of unremitting search by hardy navigators, that the Pribilof Islands were discovered. It seems that a rugged Muscovitic "stoorman," or ship's "mate," Gehrman Pribilof by name, serving under the direction and in the pay of one of the many companies engaged in the fur business at that time, was much moved and exercised in his mind by the revelations of an old Aleutian shaman at Unalaska, who pretended to recite a legend of the natives, wherein he declared that certain islands in the Bering Sea had long been known to Aleuts.[1]

Pribilof commanded a small sloop, the *St. George*, which he employed for three successive years in constant, though fruitless, explorations to the northward of Unalaska and Unimak, ranging over the whole of Bering Sea from the straits above. His ill success does not now seem strange when we understand the currents, the wind, and fogs of those waters. Why, only recently, the writer himself has been on one of the best-manned vessels that ever sailed from any port, provided with good charts and equipped with all the marine machinery known to navigation, and that vessel has hovered for nine successive days off the north point and around St. Paul Island, sometimes almost on the reef, and never more than 10 miles away, without actually knowing where the island was. So Pribilof did well, considering, since at the beginning of the third summer's tedious search, in June, 1786, his old sloop ran up against the walls of Tolstoi Mees, at St. George, and when, though the fog was so thick that he could see scarce the length of his vessel, his ears were regaled by the sweet music of seal rookeries wafted out to him on the heavy air. He knew then that he had found the object of his search, and he at once took possession of the island in the Russian name and that of his craft.

His secret could not long be kept. He had left some of his men behind him to hold the island, and when he returned to Unalaska they were gone. And when the next season had fairly opened a dozen vessels were watching him and trimming in his wake. Of course they all found the island, and in that year, July, 1787, the sailors of Pribilof, on St. George, while climbing the bluffs and straining their eyes for a relief ship, descried the low coast and scattered cones of St. Paul, 36 miles to the northwest of them. When they landed at St. George not a sign nor a vestige of human habitation was found thereon; but during the succeeding year, when they crossed over to St. Paul and took possession of it, in turn, they were surprised at finding on the south coast of that island, at a point now known as English Bay, the remains of a recent fire. There were charred embers of driftwood and places where grass had been scorched; there was a pipe, and a brass knife handle, which I regret to say have long passed beyond the cognizance of any ethnologist. This much appears in the Russian records.

[1] This legend is translated by the author, and published in the Appendix.

DESCRIPTION OF THE PRIBILOF ISLANDS.

The Pribilof Islands lie in the heart of Bering Sea, and are among the most insignificant landmarks known in that ocean. They are situated 192 miles north of Unalaska, 200 miles south of St. Matthews, and about the same distance westward of Cape Newenham on the mainland.

CLIMATE.—The islands of St. George and St. Paul are from 27 to 30 miles apart, St. George lying southeastward of St. Paul. They are far enough south to be beyond the reach of permanent ice floes, upon which polar bears could have made their way to the islands, though a few of these animals were, doubtless, always present. They laid also distant enough from the inhabited Aleutian districts and the coast of the mainland to have remained unknown to savage men. Hence they afforded the fur seal the happiest shelter and isolation, for their position seems to be such as to surround and envelop them with fog banks that fairly shut out the sun nine days in every ten during the summer and breeding season.

In this location ocean currents from the great Pacific, warmer than the normal temperature of that latitude, trending up from southward, ebb and flow around the islands as they pass, giving rise during the summer and early autumn to constant, dense, humid fog and drizzling mists, which hang in heavy banks over the islands and the sea line, seldom dissolving away to indicate a pleasant day. By the middle or end of October strong, cold winds, refrigerated on the Siberian steppes, sweep down across the islands, carrying off the moisture and clearing up the air. By the end of January or early in February they usually bring, by their steady pressure from the north and northwest, great fields of broken ice, sludgy floes, with nothing in them approximating or approaching glacial ice. They are not very heavy or thick, but still, as the wind blows, they compactly cover the whole surface of the sea, completely shutting in the land, and for months at a time hushing the wonted roar of the surf. In the exceptionally cold seasons that succeed each other up there every four or five years, for periods of three and even four months—from December to May and sometimes into June—the islands will be completely environed and icebound. On the other hand, in about the same rotation occur the exceptionally mild winters. Not even the sight of an ice floe is recorded during the whole winter, and there is very little skating on the shallow lakes and lagoons peculiar to St. Paul and St. George. This, however, is not often the case.

The breaking up of winter weather and the precipitation of summer (for there is no real spring or autumn in these latitudes) usually commences about the first week in April. The ice begins to leave or dissolve at that time or a little later, so that by the 1st or 5th of May the beaches and rocky sea margin beneath the mural precipices are generally clear and free from ice and snow, although the latter occasionally lies until the end of July or the middle of August in gullies and on leeward hill slopes, where it has drifted during the winter. Fog, thick and heavy, rolls up from the sea, and closes over the land about the end of May; this, the habitual sign of summer, holds on steadily to the middle or end of October again.

The periods of change in climate are exceedingly irregular during the autumn and spring, so called, but in summer the cool, moist, shady, gray fog is constantly present. To this certainty of favored

climate, coupled with the perfect isolation and the exceeding fitness of the ground, is due, without doubt, that preference manifested by the warm-blooded animals which come here every year in thousands and hundreds of thousands to breed, to the practical exclusion of all other ground.

A large amount of information in regard to the climate of these islands has been collected and recorded by the Signal Service, United States Army, and similar observations are still continued by the agents of the Alaska Commercial Company. I simply remark here that the winter which I passed upon St. Paul Island (1872–73) was one of great severity, and, according to the natives, such as is very seldom experienced. Cold as it was, however, the lowest marking of the thermometer was only 12° F. below zero, and that lasted but a few hours during a single day in February, while the mean of that month was 18° above. I found that March was the coldest month. Then the mean was 12° above, and I have since learned that March continues to be the meanest month of the year. The lowest average of a usual winter ranges from 22° to 26° above zero; but these quiet figures are simply inadequate to impress the reader with the exceeding discomfort of the winter in that locality. It is the wind that tortures and cripples outdoor exercise there, as it does on all the seacoast and islands of Alaska. It is blowing, blowing, from every point of the compass, at all times; it is an everlasting succession of furious gales, laden with snow and sleety spiculæ, whirling in great drifts to-day, while to-morrow the "boorga" will blow from a quarter directly opposite, and reverse its rift building of the day preceding.

Without being cold enough to suffer, one is literally confined and chained to his room from December until April by this æolian tension. I remember very well that during the winter of 1872–73 I was watching, with all the impatience which a man in full health and tired of confinement can possess, every opportunity to seize upon quiet intervals between the storms in which I could make short trips along the tracks over which I was habituated to walk during the summer; yet, in all that hyemal season I got out but three times, and then only by the exertion of great physical energy. On a day in March, for example, the velocity of the wind at St. Paul, recorded by one of the Signal-Service anemometers, was at the rate of 88 miles per hour, with as low a temperature as −4°! This particular windstorm, with snow, blew at such a velocity for six days, without an hour's cessation, while the natives passed from house to house crawling on all fours. No man could stand up against it and no man wanted to. At a much higher temperature—say at 15° or 16° above zero—with the wind blowing only 20 or 25 miles an hour, it is necessary, when journeying, to be most thoroughly wrapped up to guard against freezing.

As I have said, there are here virtually but two seasons—winter and summer. To the former belongs November and the following months up to the end of April, with a mean temperature of 20° to 28°; while the transition of summer is but a very slight elevation of that temperature, not more than 15° or 20°. Of the summer months, July, perhaps, is the warmest, with an average temperature between 46° and 50° in ordinary seasons. When the sun breaks out through the fog, and bathes the dripping, water-soaked hills and flats of the island in its hot flood of light, I have known the thermometer to rise to 60° and 64° in the shade, while the natives crawled out of the fervent and unwonted heat, anathematizing its brilliancy and potency. Sunshine does them no good; for, like the seals, they seem under its influence

to swell up at the neck. A little of it suffices handsomely for both Aleuts and pinnipedia, to whom the ordinary atmosphere is much more agreeable.

It is astonishing how rapidly snow melts here. This is due, probably, to the saline character of the air, for when the temperature is only a single degree above freezing, and after several successive days in April or May, at 34° and 36°, grass begins to grow, even if it be below melting drifts, and the frost has penetrated the ground many feet beneath. I have said that this humidity and fog, so strongly and peculiarly characteristic of the Pribilof group, was due to the warmer ocean currents setting up from the coast of Japan, and trending to the Arctic through Bering's Straits, and deflected to the southward into the North Pacific, laving, as it flows, the numerous passes and channels of the great Aleutian chain; but I do not think, nor do I wish to be understood as saying, that my observation in this respect warrants any conclusion as to so large a gulf stream flowing to the north, such as mariners and hydrographers recognize upon the Atlantic coast. I do not believe that there is anything of the kind equal to it in Bering Sea. I think, however, that there is a steady set-up to northward from southward around the seal islands, which is continued through Bering's Straits, and drifts steadily off up to the northeast, until it is lost beyond Point Barrow. That this pelagic circulation exists is clearly proven by the logs of the whalers, who, from 1845 to 1856, literally filled the air over those waters with the smoke of their "try fires," and plowed every square rod of that superficial marine area with their adventurous keels. While no two, perhaps, of those old whaling captains living to-day will agree as to the exact course of tides,[1] for Alaskan tides do not seem to obey any law, they all affirm the existence of a steady current, passing up from the south to the northeast, through Bering's Straits. The flow is not rapid, and is doubtless checked at times, for short intervals, by other causes, which need not be discussed here. It is certain, however, that there is warm water enough, abnormal to the latitude, for the evolution of the characteristic fog banks, which almost discomfited Pribilof, at the time of his discovery of the islands, nearly one hundred years ago, and which have remained ever since.

Without this fog the fur seal would never have rested there as he has done; but when he came on his voyage of discovery, ages ago, up from the rocky coasts of Patagonia, mayhap, had he not found this cool, moist temperature of St. Paul and St. George, he would have kept on, completed the circuit, and returned to those congenial antipodes of his birth.

CLOUDS.—Speaking of the stormy weather brings to my mind the beautiful, varied, and impressive nephelogical display in the heavens overhead here during October and November. I may say, without exaggeration, that the cloud effects which I have witnessed from the bluffs of this little island in those seasons of the year surpass anything that I had ever seen before. Perhaps the mighty masses of cumuli, deriving their origin from warm exhalations out of the sea and swelled and whirled with such rapidity, in spite of their appearance of solidity,

[1] The rise and fall of tide at the seal islands I carefully watched one whole season at St. Paul. The irregularity, however, of ebb and flow is the most prominent feature of the matter. The highest rise in the spring tides was a trifle over 4 feet, while that of the neap tides not much over two. Owing to the nature of the case, it is impossible to prepare a tidal calendar for Alaska, above the Aleutian Islands, which will even faintly foreshadow a correct registration in advance.

across the horizon, owe their striking brilliancy of color and prismatic tones to that low declination of the sun due to the latitude. Whatever the cause may be, and this is not the place to discuss it, certainly no other spot on earth can boast of a more striking and brilliant cloud display. In the season of 1865–66, when I was encamped on this same parallel of latitude in the mountains eastward of Sitka and the interior, I was particularly attracted by the exceeding brilliancy, persistency, and activity of the aurora; but here on St. Paul, though I eagerly looked for its dancing light, it seldom appeared; and when it did, it was a sad disappointment, the exhibition always being insignificant when compared in my mind with that flashing of my previous experience. A quaint old writer,[1] a hundred years ago, when describing Norway and its people, called attention to what he considered a very plausible theory as to the cause of the aurora. He cited an ancient sage who believed that the change of the winds threw the saline particles of the sea high into the air, and then, by aerial friction, "fermentation" took place, and the light was evolved! I am sure that the saline particles of Bering Sea were whirled into the air during the whole of that winter of my residence there, but no "fermentation" occurred, evidently, for rarely indeed did the aurora greet my eyes. In the summer season there is considerable lightning; you will see it streak its zigzag path mornings, evenings, and even noondays, but from the dark clouds and their swelling masses upon which it is portrayed no sound returns; a *fulgur brutum*, in fact. I remember hearing but one clap of thunder while in that country. If I recollect aright, and my Russian served me well, one of the old natives told me that it was no mystery, this light of the aurora, for, said he, "we all believe that there are fire mountains away up toward the north, and what we see comes from their burning throats, mirrored back on the heavens."

GEOLOGICAL STRUCTURE.—The formation of these islands, St. Paul and St. George, was recent, geologically speaking, and directly due to volcanic agency, which lifted them abruptly, though gradually, from the sea bed. Little spouting craters then actively poured out cinders and other volcanic breccia upon the table bed of basalt, depositing below as well as above the water's level as they rose, and subsequently finishing their work of construction through the agency of these spout holes or craters, from which water-puddled ashes and tufa were thrown. Soon after the elevation and deposit of the igneous matter, all active volcanic action must have ceased, though a few half-smothered outbursts seem to have occurred very recently indeed; for on Bobrovia or Otter Island, 6 miles southward of St. Paul, is the fresh, clearly blown-out throat, with the fire-scorched and smoked, smooth, sharp-cut, funnel-like walls of a crater. This is the only place on the sea islands where there are any evidences of recent discharges from the crater of a volcano.

Since the period of the upheaval of the group under discussion the sea has done much to modify and even enlarge the most important one, St. Paul, while the others, St. George and Otter, being lifted abruptly above the power of water and ice to carry and deposit sand, soil, and bowlders, are but little changed from the condition of their first appearance.

VEGETATION.—The Russians tell a rather strange story in connection with Pribilof's landing. They say that both the islands were

[1] Pontoppidan.

at first without vegetation,[1] save St. Paul, where there was a small "talneek," or willow, creeping along on the ground; and that on St. George nothing grew, not even grass, except on the place where the carcasses of dead animals rotted. Then, in the course of time, both islands became covered with grass, a great part of it being of the sedge kind, *Elymus*. This record of Veniaminov, however, is scarcely credible. There are few, surely, who will not question the opinion that the seals antedated the vegetation, for, according to his own statements, those creatures were there then in the same immense numbers that we find them to-day. The vegetation on these islands, such as it is, is fresh and luxuriant during the growing season of June and July and early August, but the beauty and economic value of trees and shrubbery, of cereals and vegetables, is denied to them by climatic conditions. Still I am strongly inclined to believe that, should some of those hardy shrubs and spruce trees indigenous at Sitka or Kadiak be transplanted properly to any of the southern hill slopes of St. Paul most favored by soil, drainage, and bluffs for shelter from saline gales, they might grow, though I know that, owing to the lack of sunlight, they would never mature their seed. There is, however, during the summer, a beautiful spread of grasses, of flowering annuals, biennials, and perennials, of gaily-colored lichens and crinkled mosses,[2] which have always afforded me great delight whenever I have pressed my way over the moors and up the hillsides of the rookeries.

There are 10 or 12 species of grasses of every variety, from close, curly, compact mats to tall stalks—tussocks of the wild wheat, *Elymus arenaria*, standing in favorable seasons waist high—the "wheat of the north"—together with over 100 varieties of annuals, perennials, spagnum, cryptogamic plants, etc., all flourishing in their respective positions, and covering nearly every point of rock, tufa, cement, and sand that a plant can grow upon, with a living coat of the greenest of all greens—for there is not sunlight enough there to ripen any perceptible tinge of ocher yellow into it—so green that it gives a deep blue tint to gray noonday shadows, contrasting pleasantly with the varying russets, reds, lemon yellows, and grays of the lichen-covered rocks, and the brownish purple of the wild wheat on the sand-dune tracts in autumn, together, also, with innumerable blue, yellow, pink, and white phænogamous blossoms, everywhere interspersed over the grassy uplands and sandy flats. Occasionally, on looking into the thickest masses of verdure, our common wild violet will be found, while the phloxes are especially bright and brilliant here. The flowers of one species of gentian, *Gentiana verna*, are very marked in their beauty; also those of a nasturtium and a creeping pea vine on the sand dunes. The blossom of one species of the pulse family is the only one here that emits a positive, rich perfume; all the others are more suggestive of that quality than expressive. The most striking plant in all the long list is the *Archangelica officinalis*, with its tall seed stalks and broad leaves, which grows first in spring and keeps green latest in the fall. The luxuriant rhubarb-like stems of this umbellifer, after they have made their rapid growth in June, are eagerly sought for by the natives, who pull them and crunch them between their teeth with all the relish that we experience in eating

[1] Veniaminov: Zapieskie Oonalashkenskaho Otdayla, etc., 1842.

[2] The mosses at Kamminista, St. Paul, are the finest examples of their kind on the islands. They are very perfect and beautiful in many species.

celery. The exhibition of ferns at Kamminista, St. Paul, during the summer of 1872, surpassed anything that I ever saw; I recall with vivid detail the exceedingly fine display made by these crenulated and waving fronds as they reared themselves above the rough interstices of the rocky ridges. From the fern roots, and those of the gentian, the natives here draw their entire stock of vegetable medicines. This floral display on St. Paul is very much more extensive and conspicuous than that on St. George, owing to the absence of any noteworthy extent of warm sand-dune country on the latter island.

When an unusually warm summer passes over the Pribilof group, followed by an open fall and a mild winter, the Elymus ripens its seed, and stands like fields of uncut grain in many places along the north shore of St. Paul and around the village, the snow not falling enough to entirely obliterate it; but it is seldom allowed to flourish to that extent. By the end of August and the first week of September of normal seasons the small edible berries of *Empetrum nigrum* and *Rubus chamæmorus* are ripe. They are found in considerable quantities, especially at Zapadnie, on both islands, and, as everywhere else throughout the circumpolar latitudes, the former is small, watery, and dark, about the size of the English or black currant; the other resembles an unripe and partially decayed raspberry. They are, however, keenly relished by the natives and even by the American residents, being the only fruit growing upon the islands.

AGRICULTURE AND ITS POSSIBILITIES.—A great many attempts have been made, both here and at St. George, to raise a few of the hardy vegetables. With the exception of growing lettuce, turnips, and radishes on the island of St. Paul, nothing has been or can be done. On St. George, on the south shore, and at the foot of a mural bluff, is a little patch of ground, of less than one-sixteenth of an acre, that appears to be so drained and so warmed by the rarely reflected sunlight from this cliff, every ray of which seems to be gathered and radiated from the rocks, as to allow the production of fair turnips, and at one season there were actually raised potatoes as large as walnuts. Gardening, however, on either island involves so much labor and so much care, with so poor a return, that it has been discontinued. It is a great deal better and a great deal easier to have the "truck" come up once a year from San Francisco on the steamer.

INSECTS.—There is one comfort which nature has vouchsafed to civilized man on these islands. There are very few indigenous insects. A large flesh fly, *Bombylius major*, appears during the summer and settles in a striking manner upon the backs of the loafing natives, or strings itself in rows of millions upon the long grass blades which flourish over the killing grounds, especially on the leafstalks of the elymus, causing this vegetation on the whole slaughtering field and vicinity to fairly droop to earth as if beaten down by a tornado of wind and rain. It makes the landscape look as though it had molded in the night, and the fungoid spores were blue and gray. Our common house fly is not present. I never saw one while I was up there. The flesh flies which I have just mentioned never came into the dwellings unless by accident; the natives say they do not annoy them, and I did not notice any disturbance among the few animals which the resident company had imported for beef and for service.

Then, again, this is perhaps the only place in all Alaska where man, primitive and civilized, is not cursed by mosquitoes. There are none here. A gnat, that is disagreeably suggestive of the real enemy just referred to, flits about in large swarms, but it is inoffensive and seeks

shelter in the grass. Several species of beetles are also numerous here. One of them, the famous green and gold carabus, is exceedingly common, crawling everywhere, and is just as bright in the rich bronzing of its wing shields as are its famous prototypes of Brazil. One or two species of *Ichneumon*, a *Cymindis*, several representatives of the *Aphidiphaga*, one or two of *Dytiscidæ*, three or four *Cicindelidæ*—these are nearly all that I found. A single dragon fly, *Perla bicaudata*, flitted over the lakes and ponds of St. Paul. The, to our eyes, familiar form of the bumblebee, *Bombus borealis*, passing from flower to flower, was rarely seen; but a few are here resident. The *Hydrocorisæ* occur in great abundance, skipping over the water in the lakes and pools everywhere, and a very few species of butterflies, principally the yellow *Nymphalidæ*, are represented by numerous individuals.

LAND MAMMALS.—Aside from the sea life on the Pribilof islands, there is no indigenous mammalian creature with the exception of the blue and white foxes, *Vulpes lagopus*, and the lemming, *Myodes obensis*. The latter is restricted, for some reason or other, to the island of St. George, where it is, or at least was, in 1874, very abundant. Its burrows and paths, under and among the grassy hummocks and mossy flats, checkered every square rod of land there covered with this vegetation. Although the island of St. Paul is but 29 or 30 miles to the northwest, not a single one of these active, curious little animals is found on it, nor could I learn from the natives that it had ever been seen there. The foxes are also restricted to these islands; that is, their kind, which are not found elsewhere, except the stray examples on St. Matthew seen by myself, and those which are carefully domesticated and preserved at Attoo, the extreme westernmost land of the Aleutian chain. These animals find comfortable holes for their accommodation and retreat on the seal islands among the countless chinks and crevices of the basaltic formation. They feed and grow fat upon sick and weakly seals, also devouring many of the pups, and they vary this diet by water fowl and eggs[1] during the summer, returning for their subsistence during the long winter to the bodies of seals upon the breeding grounds and the skinned carcasses left upon the killing fields. Were they not regularly hunted from December until April, when their fur is in its prime beauty and condition, they would swarm like the lemming on St. George, and perhaps would soon be obliged to eat one another. The natives, however, thin them out by incessant trapping and shooting during the period when the seals are away from the islands.

The Pribilof group is as yet free from rats; at least, none have got

[1] The temerity of the fox is wonderful to contemplate, as it goes on a full run or stealthy tread up and down and along the faces of almost inaccessible bluffs, in search of old and young birds and their nests and eggs, for which the "peestchee" have a keen relish. The fox always brings the egg up in its mouth, and, carrying it back a few feet from the brink of the precipice, leisurely and with gusto breaks the larger end and sucks the contents from the shell. One of the curious sights of my notice in this connection was the sly, artful, and insidious advances of Reynard at Tolstoi Mees, St. George, where, conspicuous and elegant in its fluffy white dress, it cunningly stretched on its back as though dead, making no sign of life whatever, save to gently hoist its thick brush now and then; whereupon many dull, curious sea birds, *Graculus bicristatus*, in their intense desire to know all about it, flew in narrowing circles overhead, lower and lower, closer and closer, until one of them came within the sure reach of a sudden spring and a pair of quick snapping jaws, while the gulls and others, rising safe and high above, screamed out in seeming contempt for the struggles of the unhappy "shag," and rendered hideous approbation.

off from the ships. There is no harbor at either of these islands, and the ships lie out in the roadstead so far from land that these pests do not venture to swim to the shore. Mice were long ago brought to shore in ships' cargoes, and they are a great nuisance to the white people as well as the natives throughout the islands. Hence cats also are abundant. Nowhere perhaps in the wide world are such cats to be seen as these. The tabby of our acquaintance, when she goes up there and lives upon the seal meat spread everywhere under her nose, is metamorphosed, by time of the second generation, into a stubby feline ball; in other words, she becomes thickened, short, and loses part of the normal length of her tail; also her voice is prolonged and resonant far beyond the misery which she inflicts upon our ears here. These cats actually swarm about the natives' houses, never in them much, for only a tithe of their whole number can be made pets of; but they do make night hideous beyond all description. They repair for shelter often to the chinks of precipices and bluffs, but, although not exactly wild, yet they can not be approached or cajoled. The natives, when their sluggish wits are periodically thoroughly aroused and disturbed by the volume of cat calls in the village, sally out and by a vigorous effort abate the nuisance for the time being. The most extravagant caterwauling alone will or can arouse this Aleutian ire.

STOCK AND POULTRY RAISING.—On account of the severe climatic conditions it is of course impracticable to keep stock here with any profit or pleasure. The experiment has been tried faithfully. It is found best to bring beef cattle up in the spring on the steamer, turn them out to pasture until the close of the season, in October and November, and then, if the snow comes, to kill them and keep them refrigerated the rest of the year. Stock can not be profitably raised here, the proportion of severe weather annually is too great—from three to perhaps six months of every year they require feeding and watering, with good shelter. To furnish an animal with hay and grain up there is a costly matter, and the dampness of the growing summer season on both islands renders haymaking impracticable. Perhaps a few head of hardy Siberian cattle might pick up a living on the north shore of St. Paul, among the grasses and sand dunes there, with nothing more than shelter and water given them, but they would need both of those attentions. Then the care of them would hardly return expenses, as the entire grazing ground could not support any number of animals. It is less than 2 square miles in extent, and half of this area is unproductive. Then, too, a struggle for existence would reduce the flesh and vitality of these cattle to so low an ebb that it is doubtful whether they could be put through another winter alive, especially if severe. I was then, and am now, strongly inclined to think that if a few of those Siberian reindeer could be brought over to St. Paul and to St. George they would make a very successful struggle for existence, and be a source of a good supply, summer and winter, of fresh meat for the agents of the Government and the company who may be living upon the islands. I do not think that they would be inclined to molest or visit the seal grounds; at least, I noticed that the cattle and mules of the company running loose on St. Paul were careful never to poke around on the outskirts of a rookery, and deer would be more timid and less obtrusive than our domesticated animals. But I did notice on St. George that a little squad of sheep, brought up and turned out there for a summer's feeding, seemed to be so attracted by the quiet calls of the pups on the rookeries that they were drawn to and remained by the seals without disturbing them at all, to their own

physical detriment, for they lost better pasturage by so doing. The natives of St. Paul have a strange passion for seal-fed pork, and there are quite a large number of hogs on the island of St. Paul and a few on St. George. The pigs soon become entirely carnivorous, living, to the practical exclusion of all other diet, on the carcasses of seals.

Chickens are kept with much difficulty; in fact it is only possible to save their lives when the natives take them into their own rooms, or keep them above their heads, in their dwellings, during winter.

BIRD LIFE.—While the great exhibition of pinnipedia preponderates over every other feature of animal life on the seal islands, still we find a wonderful aggregate of ornithological representation thereon. The spectacle of birds nesting and breeding, as they do at St. George Island, to the number of millions, flecking those high basaltic bluffs of its shore line, 29 miles in length, with color patches of black, brown, and white, as they perch or cling to the mural cliffs in the labor of incubation, is a sight of exceeding attraction and constant novelty. It affords the naturalist an opportunity of a lifetime for minute investigation into all the details of the reproduction of these vast flocks of circumboreal waterfowl. The island of St. Paul, owing to the low character of its shore line—a large proportion of which is but slightly elevated above the sea and is sandy—is not visited, and can not be visited, by such myriads of birds as are seen at St. George; but the small, rocky Walrus Islet is fairly covered with seafowls, and the Otter Island bluffs are crowded by them to their utmost capacity of reception. The birds string themselves anew around the cliffs with every succeeding season, like endless ribbons stretched across their rugged faces, while their numbers are simply countless. The variety is not great, however, in these millions of breeding birds. It consists of only ten or twelve names; the whole list of avafauna belonging to the Pribilof Islands, stragglers and migatory, contains but 40 species. Conspicuous among the last-named class is the robin, a straggler which was brought from the mainland, evidently against its own effort, by a storm or a gale of wind, which also brings against their will the solitary hawks, owls, and waders occasionally noticed here.

After the dead silence of a long, ice-bound winter, the arrival of large flocks of those sparrows of the north, the "choochkies," *Phaleris microceros*, is most cheerful and interesting. Those plump little auks are bright, fearless, vivacious birds, with bodies round and fat. They come usually in chattering flocks on or immediately after the 1st of May, and are caught by the people with hand scoops or dip nets to any number that may be required for the day's consumption; their tiny, rotund forms making pies of rare, savory virtue, and being also baked and roasted and stewed in every conceivable shape by the Russian cooks; indeed they are equal to the reedbirds of the South. These welcome visitors are succeeded along about the 20th of July by large flocks of fat, red-legged turnstones, *Strepsilas interpres*, which come in suddenly from the west or north, where they have been breeding, and stop on the islands for a month or six weeks, as the case may be, to feed luxuriantly upon the flesh flies, which we have just noticed, and their eggs. Those handsome birds go in among the seals, familiarly chasing the flies, gnats, etc. They are followed, as they leave in September, by several species of jacksnipe and a plover, *Tringa* and *Charadrius;* these, however, soon depart—as early as the end of October and the beginning of November—and then winter fairly closes in upon the islands; the loud, roaring, incessant seal din, together with the screams and darkening flight of innumerable waterfowl, are

replaced in turn again by absolute silence, marking out as it were, in lines of sharp and vivid contrast, summer's life and winter's death.

The author of that quaint old saying, "Birds of a feather flock together," might well have gained his inspiration had he stood under the high bluffs of St. George at any season, prehistoric or present, during the breeding of the water birds there, where myriads of croaking murres and flocks of screaming gulls darken the light of day with their fluttering forms, and deafen the ear with their shrill, harsh cries as they do now, for music is denied to all those birds of the sea. Still, in spite of the apparent confusion, he would have taken cognizance of the fact that each species had its particular location and kept to its own boundary, according to the precision of natural law.

FISHES.—With regard to the herpetology of the islands, I may state that the most careful search on my part was not rewarded by the discovery of a single reptile. In the province of ichthyology I gathered only a few specimens, the scarcity of fish being easily traceable to the presence of the seals on the grounds here. Naturally enough the finny tribes avoid the seal-churned waters for at least 100 miles around. Among the few specimens, however, which I collected, three or four species new to natural science were found and have since been named by experts in the Smithsonian Institution.

The presence of such great numbers of amphibian mammalia about the waters, during five or six months of every year, renders all fishing abortive, and unless expeditions are made seven or eight miles at least from the land, and you desire to catch large halibut, it is a waste of time to cast your line over the gunwale of the boat. The natives capture "poltoos" or halibut, *Hippoglossus vulgaris*, within two or three miles of the Reef point on St. Paul and the south shore, during July and August. After this season the weather is usually so stormy and cold that the fishermen venture no more until the ensuing summer.

AQUATIC INVERTEBRATES.—With regard to the *Mollusca* of the Pribilof waters, the characteristic forms of *Toxoglossata* and *Heteroglossata* peculiar to this north latitude are most abundant; of the *Cephalopoda* I have seen only a species of squid, *Sepia loligo*. The clustering whelks, *Buccinoid*, literally conceal large areas of the bowlders on the beaches here and there; they are in immense numbers, and are crushed under your foot at almost every step when you pass over long reaches of rocky shingle at low tide. A few of the larger *Fusus* are found, and the live and dead shells of *Limacina* are in great abundance wherever the floating kelp beds afford them shelter.

On land a very large number of shells of the genera *Succinea* and *Pupa* abound all over the islands; on the bluffs of St. George just over Garden Cove I gathered a beautiful *Helix*.

The little fresh-water lakes and ponds contain a great quantity of representatives of the characteristic genera *Planorbis*, *Melania*, *Limnea*, and that pretty little bivalve, the *Cyclas*.

Of the *Crustacea*, the *Annelidæ*, and *Echinodermata*, there is abundant representation here. The sea urchins, "repkie" of the natives, are eagerly sought for at low tide and eaten raw by them. The Arctic sea clam, *Mya truncata*, is once in a long time found here (it is the chief food of the walrus of Alaska), and the species of *Mytilus*, the mussels, so abundant in the Aleutian archipelago, are almost absent here at St. Paul, and only sparingly found at St. George.

The waters fairly swarm with an enormous number and variety of *Medusæ* or jelly-fishes.

The seaweeds are exceedingly varied and abundant here, great heaps of their assorted fronds are tossed up by every gale to rot upon the beaches.

DIMENSIONS AND CONTOUR OF THE ISLANDS.—Until my arrival on the seal islands in April, 1872, no steps had ever been taken by any man whomsoever toward ascertaining the extent and real importance of these interests of the Government; the Russians never having made even an approximate survey of the land, while our own people did no better. I was very much surprised, immediately after landing, and calling for a map of the island of St. Paul, to have an odd sketch, traced from an old Russian chart, placed before me, that my eye stamped instantly as grotesque, by the land bearings which I took out of my window on the spot. It was a matter of no special concern, however, to the Russians; had it been, doubtless they would have accurately surveyed the whole field. But it was and is quite different with us; and that no agent of the Treasury Department, or other branches of the Government, had, up to the date of my arrival, given it the slightest thought or attention, struck me as rather strange. It was, as it is, and ever will be, a matter of first importance to a correct and succinct understanding of the subject, and it was the first thing about which I busied myself. I present, therefore, with this memoir, a careful chart of each island and the contiguous islets, which are the first surveys ever made upon the ground having the slightest pretension to accuracy.[1] The reader will observe, as he turns to these maps, the striking dissimilarity which exists between them, not only in contour, but in physical structure, the island of St. Paul being the largest in superficial area, and receiving a vast majority of the pinnipedia that belong to both. As it lies in Bering Sea to-day, this island is in its greatest length, between northeast and southwest points, 13 miles, air line; and a little less than 6 at points of greatest width. It has a superficial area of about 33 square miles, or 21,120 acres, of diversified, rough, and rocky uplands, rugged hills, and smooth, volcanic cones, which either set down boldly to the sea or fade out into extensive wet and mossy flats, passing at the sea margins into dry, drifting, sand-dune tracts. It has 42 miles of shore line, and of this coast 16½ miles are hauled over by fur seals *en masse*. At the time of its first upheaval above the sea it doubtless presented the appearance of ten or twelve small rocky, bluffy islets and points, upon some of which were craters that vomited breccia and cinders, with little or no lava overflowing. Active plutonic agency must have soon ceased after this elevation, and then the sea around about commenced the work which it is now engaged in: of building on the skeleton thus created; and it has progressed to-day so thoroughly and successfully in its labor of sand shifting, together with the aid of ice floes, in their action of grinding, lifting, and shoving, that nearly all of these scattered islets within the present area of the island, and marked by its bluffs and higher uplands, are completely bound together by ropes of sand, changed into enduring bars and ridges of water-worn bowlders. These are raised above the highest tides by winds that whirl the sand up, over, and on them, as it drives out from the wash of the surf and from the interstices of the rocks, lifted up and pushed by ice fields.

LAND AND SCENERY.—The sand which plays so important a part in the formation of the island of St. Paul, and which is almost entirely

[1] These surveys have since been confirmed and elaborated by H. W. McIntyre, of the Alaska Commercial Company, and Lieut. Washburn Maynard, U. S. N.

wanting in and around the others in this Pribilof group, is principally composed of *Foraminifera*, together with *Diatomacea*, mixed in with a volcanic base of fine comminuted black and reddish lavas and old friable gray slates. It constitutes the chief beauty of the seashore here, for it changes color like a chameleon as it passes from wet to dry, being a rich, steely black at the surf margin and then drying out to a soft purplish brown and gray, succeeding to tints most delicate of reddish and pale neutral, when warmed by the sun and drifting up on to the higher ground with the wind. The sand-dune tracts on this island are really attractive in the summer, especially so during those rare days when the sun comes forth—the unwonted light shimmers over them and the most luxuriant grass and variety of beautiful flowers, which exist in profusion thereon. In past time, as these sand and bowlder bars were forming on St. Paul Island, they, in making across from islet to islet, inclosed small bodies of sea water. These have, by evaporation and time, by the flooding of rains and annual melting of snow, become, nearly every one of them, fresh. They are all, great and small, well shown on my map, which locates quite a large area of pure water. In them, as I have hinted, are no reptiles; but an exquisite species of tiny viviparous fish exists in the lagoon estuary near the village and the small pure-water lakes of the natives just under the flanks of Telegraph Hill. The Aleuts assured me that they had caught fish in the great lake toward Northeast Point when they lived in their old village out there, but I never succeeded in getting a single specimen. The waters of these pools and ponds are fairly alive with vast numbers of minute *Rotifera*, which sport about in all of them when, ever they are examined. Many species of water plants, pond lilies-algæ, etc., are found in the inland waters, especially in the large lake Mee-sulk-mah-nee, that is very shallow.

The backbone of the island, running directly east and west, from shore to shore, between Polavina Point and Einahnuhto Hills, constitutes the high land of the island. Polavina Sopka, an old extinct cinder crater, 550 feet; Boga Slov, an upheaved mass of splinted lava, 600 feet, and the hills frowning over the bluffs there, on the west shore, are also 600 feet in elevation above the sea; but the average height of the upland between is not much over 100 to 150 feet above water level, rising here and there into little hills and broad, rocky ridges, which are minutely sketched upon the map. From the northern base of Polavina Sopka a long stretch of low sand flats extend, inclosing the great lake, and ending in a narrow neck where it unites with Novastoshnah, or Northeast Point. Here the volcanic nodule known as Hutchinsons Hill, with its low, gradual slopes, trending to the east and southward, makes a rocky foundation secure and broad, upon which the great single rookery of the island—the greatest in the world, undoubtedly—is located. The natives say that when they first came to these islands Novastoshnah was an island by itself, to which they went in boats from Vesolia Mista; and the lagoon now so tightly inclosed was then an open harbor, in which the ships of the old Russian company rode safely at anchor. To-day no vessel drawing 10 feet of water can get nearer than half a mile of the village, or a mile from this lagoon.

LACK OF HARBORS: ANCHORAGES.—The total absence of a harbor at the Pribilof Islands is much to be regretted. The village of St. Paul, as will be seen by reference to the map, is so located as to command the best landings for vessels that can be made during the prevalence of any and all winds, except those from the south. From these

there is no shelter for ships unless they run around to the north side, where they are unable to hold practicable communication with the people or to discharge. At St. George matters are still worse, for the prevailing northerly, westerly, and easterly winds drive the boats away from the village roadstead, and weeks often pass at either island, but more frequently at the latter, ere a cargo is landed at its destination. Under the very best circumstances it is both hazardous and trying to load and unload ship at any of these places. The approach to St. Paul by water during thick weather is doubtful and dangerous, for the land is mostly low at the coast and the fogs hang so dense and heavy over and around the hills as to completely obliterate their presence from vision. The captain fairly feels his way in by throwing his lead line and straining his ear to catch the muffled roar of the seal rookeries, which are easily detected when once understood, high above the booming of the surf. At St. George, however, the bold, abrupt, bluffy coast everywhere all around, with its circling girdle of flying water birds far out to sea, looms up quite prominently, even in the fog; or, in other words, the navigator can notice it before he is hard aground or struggling to haul to windward from the breakers under his lee. There are no reefs making out from St. George worthy of notice, but there are several very dangerous and extended ones peculiar to St. Paul, which Capt. John G. Baker, in command of the vessel[1] under my direction, carefully sounded out, and which I have placed upon my chart for the guidance of those who may sail in my wake hereafter.

When the wind blows from the north, northwest, and west to southwest, the company's steamer trips her anchor in 8 fathoms of water abreast of the Black Bluffs opposite the village, from which anchorage her stores are lightered ashore; but in the northeasterly, easterly, and southeasterly winds she hauls around to the Lagoon Bay, west of the village, and there, little less than half a mile from the landing, she drops her anchor in 9 fathoms of water, and makes considerable headway at discharging her cargo. Sailing craft come to both anchorages, but, however, keep still farther out, though they choose relatively the same positions, but seek deeper water to swing to their cables in. The holding ground is excellent. At St. George the steamer comes, wind permitting, directly to the village on the north shore, close in, and finds her anchorage in 10 fathoms of water, in poor holding ground; but it is only when three or four days have passed free from northerly, westerly, or easterly winds that she can make the first attempt to safely unload. The landing here is a very bad one, surf breaking most violently upon the rocks from one end of the year to the other.

OTTER ISLAND.—The observer will notice that 6 miles southward and westward of the reef of St. Paul Island is a bluffy islet, called by the Russians Otter Island, because in olden time the Promyshleniks are said to have captured many thousands of sea otters on its stony coast. It rises from the ocean, sheer and bold, an unbroken mural precipice extending nearly all around, of sea front, but dropping on its northern margin, at the water, low, and slightly elevated above the surf wash, with a broken, rocky beach and no sand. The height of the cliffs, at their greatest elevation over the west end, is 300 feet, while the eastern extremity is quite low, and terminated by a queer, funnel-shaped crater hill, which is as distinctly defined and

[1] United States revenue-marine cutter Reliance, June to October, 1874.

as plainly scorched, and devoid of the slightest sign of vegetation within, as though it had burned up and out yesterday. This crater point on Otter Island is the only unique feature of the place, for with the exception of that low north shore before mentioned, where many thousands of bachelor seals haul out during the season every year, there is nothing else worthy of notice concerning it. A bad reef makes out to the westward and northward, which I have indicated from my observation of the rocks awash, looking down upon them from the bluffs. Great numbers of waterfowl roost upon the cliffs, and there are here about as many blue foxes to the acre as the law of life allows. A small, shallow pool of impure water lies close down to the north shore, right under a low hill, upon which the Russians in olden time

EAST SHORE.

[Bearing west by compass, 3 miles distant.]

posted a huge Greek cross that is still standing; indeed, it was their habit to erect crosses on all the hills in those olden times. One of them is standing at Northeast Point, on the large sand dune which I have called St. John or Cross Hill; and another one, a sound, stalwart stick, yet faces the gale and driving "boorgas" to-day on Boga Slov, as it has faced them for the last sixty years. Otter Island has, since my return in 1872, had considerable attention in the Treasury Department, owing to the fact that certain parties contended that it lies without the jurisdiction of the law which covers and protects the seal life on the Pribilof Islands. This survey of mine, however, settles that question—the island is within the pale of law. It is a rock adjacent to and in the waters of St. Paul, and resorted to only by those seals which are born upon and belong to the breeding grounds of St.

PROFILE OF THE NORTH SHORE OF OTTER ISLAND (from steamer's anchorage, Zoltoi bay, St. Paul).

[Bearing south by compass, 6 miles distant.]

Paul and St. George, and I have never seen at any one time more than three or four thousand "holluschickie" hauled out here.

WALRUS ISLAND.—To the eastward, 6 miles from Northeast Point, will be noticed a small rock named Walrus Island. It is a mere ledge of lava, flat capped, lifted just above the wash of angry waves; indeed, in storms of great power, the observer, standing on either Cross or Hutchinson's hills, with a field glass, can see the water breaking clear over it. These storms, however, occur late in the season, usually in October or November. This island has little or no commercial importance, being scarcely more than a quarter of a mile in length and 100 yards in point of greatest width, with bold water all around, entirely free from reefs or sunken rocks. As might be expected, there is no

fresh water on it. In a fog it makes an ugly neighbor for the sea captains when they are searching for St. Paul; they all know it, and they all dread it. It is not resorted to by the fur seals or by sea lions in particular; but, singularly enough, it is frequented by several hundred male walrus, to the exclusion of females, every summer. A few sea lions, but only a very few, however, breed here. On account of the rough weather, fogs, etc., this little islet is seldom visited by the natives of St. Paul, and then only in the egging season of late June and early July; then that surf-beaten rock literally swarms with breeding waterfowl.

This low, tiny, rocky islet is, perhaps, the most interesting single spot now known to the naturalist, who may land in northern seas, to study the habits of bird life; for here, without exertion or risk, he can observe and walk among tens upon tens of thousands of screaming waterfowl, and as he sits down upon the polished lava rock, he becomes literally ignored and environed by these feathered friends, as they reassume their varied positions of incubation, which he disturbs them from by his arrival. Generation after generation of their kind have resorted to this rock unmolested, and to-day, when you get among them, all doubt and distrust seems to have been eliminated from their natures. The island itself is rather unusual in those formations which we find peculiar to Alaskan waters. It is almost flat, with slight, irregular undulations on top, spreading over an area of 5 acres, perhaps. It rises abruptly, though low, from the sea, and it has no safe beach upon which a person can land from a boat; not a stick of timber or twig of shrubbery ever grew upon it, though the scant presence of low, crawling grasses in the central portions prevents the statement that all vegetation is absent. Were it not for the frequent rains and dissolving fog, characteristic of summer weather here, the guano accumulation would be something wonderful to contemplate—Peru would have a rival. As it is, however, the birds, when they return, year after year, find their nesting floor swept as clean as though they had never sojourned there before. The scene of confusion and uproar that presented itself to my astonished senses when I approached this place in search of eggs, one threatening, foggy July morning, may be better imagined than described, for as the clumsy bidarrah came under the lee of the low cliffs, swarm upon swarm of thousands of murres or "aries" dropped in fright from their nesting shelves, and before they had control of their flight they struck to the right and left of me, like so many cannon balls. I was forced, in self-protection, to instantly crouch for a few moments under the gunwale of the boat until the struggling, startled flock passed, like an irresistible, surging wave, over my head. Words can not depict the amazement and curiosity with which I gazed around, after climbing up to the rocky plateau and standing among myriads of breeding birds, that fairly covered the entire surface of the island with their shrinking forms, while others whirled in rapid flight over my head, as wheels within wheels, so thickly interrunning that the blue and gray of the sky was hidden from my view. Add to this impression the stunning whir of hundreds of thousands of strong, beating wings, the shrill screams of the gulls, and the muffled croaking of the "aries," coupled with an indescribable, disagreeable smell which arose from the broken eggs and other decaying substances, and a faint idea may be evoked of the strange reality spread before me. Were it not for this island and the ease with which the natives can gather, in a few hours, tons upon tons of sea-fowl eggs, the people of the village would be obliged to go to the

westward, and suspend themselves from the lofty cliffs of Einahnuhto, dangling over the sea by ropes, as their neighbors are only too glad and willing to do at St. George.

ST. PAUL.—A glance at the map of St. Paul shows that nearly half of its superficial area is low and quite flat, not much elevated above the sea. Wherever the sand-dune tracts are located, and that is right along the coast, is found an irregular succession of hummocks and hillocks, drifted by the wind, which are very characteristic. On the summits of these hillocks the elymus has taken root in times past, and as the sand drifts up it keeps growing on and up, so that the quaint spectacle is presented of large stretches to the view, wherein sand dunes, entirely bare of all vegetation at their base and on their sides, are crowned with a living cap of the brightest green—a tuft of long, waving grass blades which will not down. None of this peculiar landscaping, however, is seen on St. George, not even in the faintest degree. Travel about St. Paul, with the exception of the road to Northeast Point, where the natives take advantage of low water to run on the hard, wet sand, is exceedingly difficult, and there are examples of only a few white men who have ever taken the trouble and expended the physical energy necessary to accomplish the comparatively short walk from the village to Nahsayvernia, or the north shore. Walking over the moss-hidden and slippery rocks, or tumbling over slightly uncertain tussocks, is a task and not a pleasure. On St. George, with the exception of a half-mile path to the village cemetery and back, nobody pretends to walk, except the natives who go to and from the rookeries in their regular seal drives. Indeed, I am told that I am the only white man who has ever traversed the entire coast line of both islands. (See note, 39, E.)

ST. GEORGE.—Turning to St. George and its profile, presented by the accompanying map, the observer will be struck at once by the solidity of that little island and its great boldness, rising, as it does, sheer and precipitous from the sea all around, except at the three short reaches of the coast indicated on the chart, and where the only chance to come ashore exists.

The seals naturally have no such opportunity to gain a footing here as they have on St. Paul, hence their comparative insignificance as to number. The island itself is a trifle over 10 miles in extreme length, east and west, and about 4¼ miles in greatest width, north and south. It looks, when plotted, somewhat like an old stone ax; and, indeed, when I had finished my first contours from my field notes, the ancient stone-ax outline so disturbed me that I felt obliged to resurvey the southern shore, in order that I might satisfy my own mind as to the accuracy of my first work. It consists of two great plateaus, with a high upland valley between, the western table-land dropping abruptly to the sea at Dalnoi Mees, while the eastern falls as precipitately at Waterfall Head and Tolstoi Mees. There are several little reservoirs of fresh water—I can scarcely call them lakes—on this island; pools, rather, that the wet sphagnum seems to always keep full, and from which drinking water in abundance is everywhere found. At Garden Cove a small stream, the only one on the Pribilof group, empties into the sea.

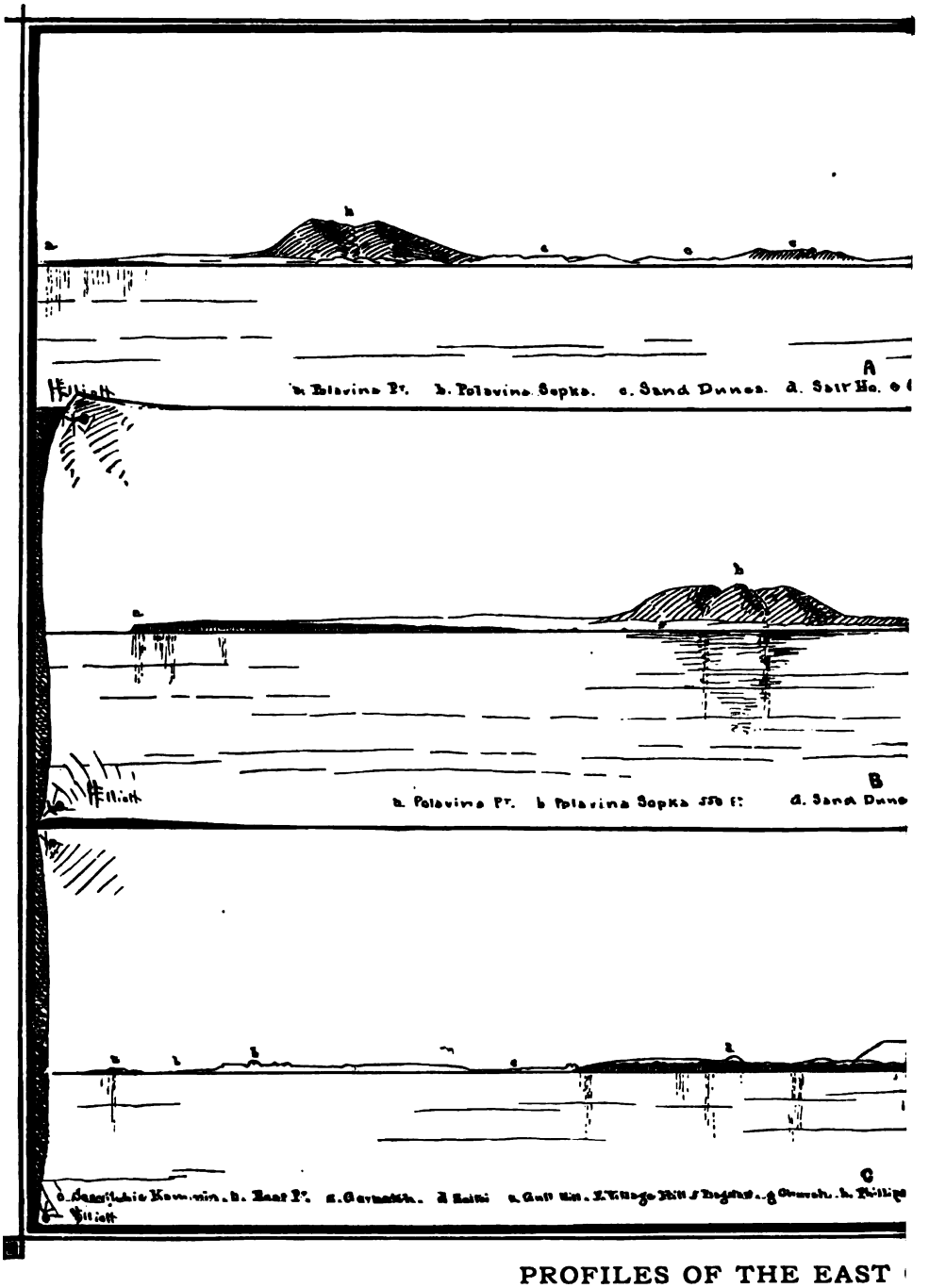
St. George has an area of about 27 square miles; it has 29 miles of coast line, of which only 2¼ are visited by the fur seals, and which is, in fact, all the eligible landing ground afforded them by the structure of the island. Nearly half of the shore of St. Paul is a sandy beach, while on St. George there is less than a mile of it all put together,

namely, a few hundred yards in front of the village, the same extent on the Garden Cove beach, southeast side, and less than half a mile at Zapadnie, on the south side.

Just above the Garden Cove, under the overhanging bluffs, several thousand sea lions hold exclusive, though shy, possession. Here there is a half mile of good landing. On the north shore of the island, 3 miles west from the village, a grand bluff wall, of basalt and tufa intercalated, rises abruptly from the sea to a sheer height of 920 feet at its reach of greatest elevation, thence, dropping a little, runs clear around the island to Zapadnie, a distance of nearly 10 miles, without affording a single passageway up or down to the sea that thunders at its base. Upon its innumerable narrow shelf margins and in its countless chinks and crannies, and back therefrom over the extended area of lava-shingled inland ridges and terraces, millions upon millions of waterfowl breed during the summer months.

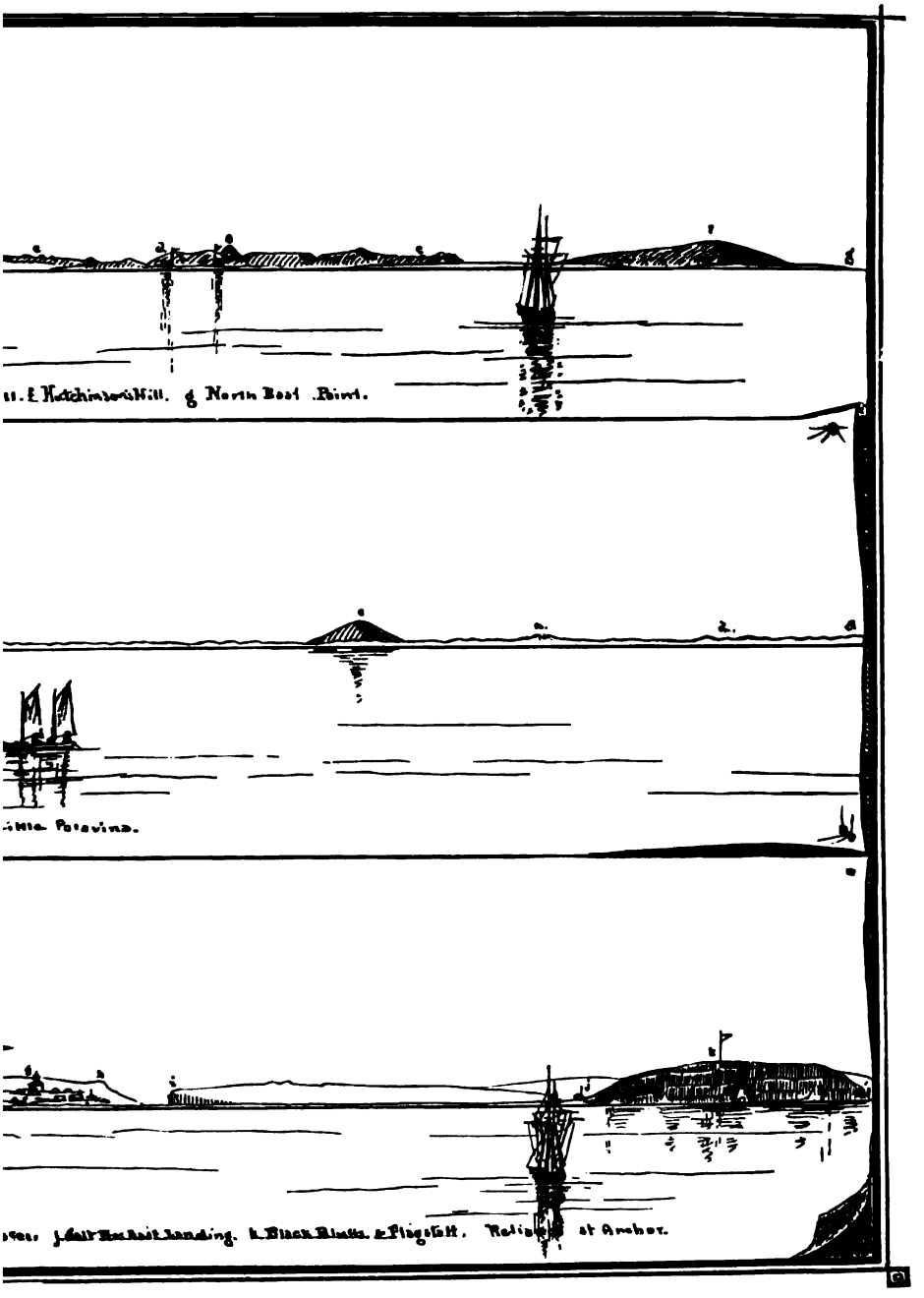
The general altitude of St. George, though in itself not great, has, however, an average three times higher than that of St. Paul, the elevation of which is quite low, and slopes gently down to the sea east and north; St. George rises abruptly, with exceptional spots for landing. The loftiest summit on St. George—the top of the hill right back to the southward of the village—is 930 feet, and is called by the natives Ahluckeyak. That on St. Paul, as I have before said, is Boga Slov hill—600 feet. All elevations on either island, 15 or 20 feet above sea level, are rough and hummocky, with the exception of the sand-dune tracts at St. Paul and the summits of the cinder hills, on both islands. Weathered out or washed from the basalt and pockets of olivine on either island are aggregates of augite, seen most abundant on the summit slopes of Ahluckeyak Hill, St. George. Specimens from the stratified bands of old, friable, gray lavas, so conspicuous on the shore of this latter island, show the existence of hornblende and vitreous feldspar in considerable quantity, while on the south shore, near the Garden Cove, is a large dike of a bluish and greenish gray phonolith, in which numerous small crystals of spinel are found. A dike, with well-defined walls of old, close-grained, clay-colored lava, is near the village of St. George, about a quarter of a mile east from the landing, in the face of those reddish breccia bluffs that rise from the sea. It is the only example of the kind on the islands. The bases or foundations of the Pribilof Islands are, all of them, basaltic; some are compact and grayish-white, but most of them exceedingly porous and ferruginous. Upon this solid floor are many hills of brown and red tufa, cinder heaps, etc. Polavina Sopka, the second point in elevation on St. Paul Island, is almost entirely built up of red scoria and breccia; so is Ahluckeyak Hill, on St. George and the cap to the high bluffs opposite. The village hill at St. Paul, Cone Hill, the Einahnuhto Peaks, Crater Hill, North Hill, and Little Polavina are all ash heaps of this character. The bluffs at the shore of Polavina Point, St. Paul, show in a striking manner a section of the geological structure of the island. The tufas on both islands, at the surface, decompose and weather into the base of good soil, which the severe climate, however, renders useless to the husbandman. There is not a trace of a granitic or a gneissic rock found *in situ*. Metamorphic bowlders have been collected along the beaches and pushed up by the ice floes which have brought them down from the Siberian coast away to the northwest. The dark-brown tufa bluffs and the breccia walls at the east landing of St. Paul Island, known as "Black Bluffs," rise suddenly from the sea 60 to 80 feet, with stratified horizontal lines of

Plate I.



PROFILES OF THE EAST

A. Northeast shore of St. Paul Island, from a poin
B. Polavina Sopka and Point, from a seaward vie
C. Village and East Landing, from the usual anch



T OF ST. PAUL ISLAND.

out 8 miles distant to eastward, magnetic.
distant; the mountain bearing west, magnetic.
: 1 mile distant.

light-gray calcareous conglomerate, or cement, in which are imbedded sundry fossils characteristic of and belonging to the Tertiary age, such as *Cardium grœnlandicum*, *C. decoratum* and *Astarte pectunculata*, etc. This is the only locality within the purview of the Pribilof Islands where any paleontological evidence of their age can be found. These specimens, as indicated, are exceedingly abundant; I brought down a whole series, gathered there at the east landing, or Navastock, in a short half-hour's search and labor.

WHY THESE ISLANDS ARE FREQUENTED BY FUR SEALS.—The fact that the fur seals frequent these islands and those of Bering and Copper, on the Russian side, to the exclusion of other land, seems at first a little singular, to say the least; but when we come to examine the subject, we find that these animals, when they repair hither to rest for two or three months on the land, as they must do by their habit during the breeding season, they require a cool, moist atmosphere, imperatively coupled with firm, well-drained land, or dry, broken rocks, or shingle rather, upon which to take their positions and remain undisturbed by the weather and the sea for the lengthy period of reproduction. If the rookery ground is hard and flat, with an admixture of loam or soil, puddles are speedily formed in this climate, where it rains almost every day, and when not raining, rain fogs take quick succession and continue the saturation, making thus a muddy slime, which very quickly takes the hair off the animals whenever it plasters or wherever it fastens on them; hence, they carefully avoid any such landing. If they occupy a sandy shore, the rain beats that material into their large, sensitive eyes, and into their fur, so they are obliged, from simple irritation, to leave and hunt the sea for relief.

The seal islands now under discussion offer to the pinnipedia very remarkable advantages for landing, especially St. Paul, where the ground of basaltic rock and of volcanic tufa or cement slopes up from so many points gradually above the sea, making thereby a perfectly adapted resting place for any number, from a thousand to millions, of those intelligent animals, which can lie out here from May until October every year in perfect physical peace and security. There is not a rod of ground of this character offered to these animals elsewhere in all Alaska—not on the Aleutian chain, not on the mainland, not on St. Matthew or St. Lawrence. Both of the latter islands were surveyed by myself, with special reference to this query, in 1874. Every foot of St. Matthew shore line was examined, and I know that the fur seal could not rest on the low clayey lava flats there in contentment a single day; hence he never has rested there, nor will he in the future. As to St. Lawrence, it is so ice bound and snow covered in spring and early summer, to say nothing of numerous other physical disadvantages, that it never becomes of the slightest interest to the seals.

THE NATIVES OF THE ISLANDS.

COLONIZATION BY RUSSIANS AND ALEUTS: EARLY HISTORY.—When Pribilof, in taking possession, landed on St. George a part of his little ship's crew, July, 1786, he knew that, as it was uninhabited, it would be necessary to create a colony there, from which to draft laborers to do the killing, skinning, and curing of the peltries; therefore he and his associates, and his rivals after him, imported natives of Unalaska and Atkha—passive, docile Aleuts. They founded their first village a quarter of a mile to the eastward of one of the principal rookeries on St. George, now called Starry Ateel, or Old Settlement; a village

was also located at Zapadnie, and a succession of barrabaras planted at Garden Cove. Then, during the following season, more men were brought up from Atkha and taken over to St. Paul, where five or six rival traders posted themselves on the north shore, near and at Maroonitch, and at the head of the Big Lake, among the sand dunes there. They were then, as they are now, somewhat given to riotous living, if they only had the chance, and the ruins of the Big Lake settlement are pleasantly remembered by the descendants of those pioneers to-day on St. Paul, who take off their hats as they pass by to affectionately salute and call the place "Vesolia Mista," or "Jolly Spot," the old men telling me, in a low whisper, that "in those good old days they had plenty of rum." But when the pressure of competition became great another village was located at Polavina, and still another at Zapadnie, until the activity and unscrupulous energy of all these rival settlements well nigh drove out and eliminated the seals in 1796. Three years later the whole territory of Alaska passed into the hands of the absolute power vested in the Russian-American Company. These islands were in the bill of sale, and early in 1799 the competing traders were turned off neck and heels from them, and the Pribilof group passed under the control of a single man—the iron-willed Baranov. The people on St. Paul were then all drawn together, for economy and warmth, into a single settlement at Polavina. Their life in those days must have been miserable. They were mere slaves, without the slightest redress from any insolence or injury which their masters might see fit, in petulance or brutal orgies, to inflict upon them. Here they lived and died, unnoticed and uncared for, in large barracoons half under ground and dirt roofed, cold, and filthy. Along toward the beginning or end of 1825, in order that they might reap the advantage of being located best to load and unload ships, the Polavina settlement was removed to the present village site, as indicated on the map, and the natives have lived there ever since.

On St. George the several scattered villages were abandoned, and consolidated at the existing location some years later, but for a different reason. The labor of bringing the seal skins over to Garden Cove, which is the best and surest landing, was so great, and that of carrying them from the north shore to Zapadnie still greater, that it was decided to place the consolidated settlement at such a point between them, on the north shore, that the least trouble and exertion of conveyance would be necessary. A better place, geographically, for the business of gathering the skins and salting them down at St. George can not be found on the island, but a poorer place for a landing it is difficult to pick out, though in this respect there is not much choice outside of Garden Cove.

CONTRAST IN THE CONDITION OF THE INHABITANTS UNDER RUSSIAN AND AMERICAN RULE.—Up to the time of the transfer of the territory and leasing of the islands to the Alaska Commercial Company, in August, 1870, these native inhabitants all lived in huts or sod-walled and dirt-roofed houses, called "barrabkies," partly under ground. Most of these huts were damp, dark, and exceedingly filthy. It seemed to be the policy of the short-sighted Russian management to keep them so, and to treat the natives not near so well as they treated the few hogs and dogs which they brought up here for food and for company. The use of seal fat for fuel caused the deposit upon everything within doors of a thick coat of greasy, black soot, strongly impregnated with a damp, moldy, and indescribably offensive odor. They found along the north shore of St. Paul and at Northeast Point occa-

sional scattered pieces of driftwood, which they used, carefully soaked anew in water if it had dried out, split into little fragments, and, trussing the blubber with it when making their fires, the combination gave rise to a roaring, sputtering blaze. If this driftwood failed them at any time when winter came round, they were obliged to huddle together beneath skins in their cold huts, and live or die, as the case might be. But the situation to-day has changed marvelously. We see here now at St. Paul, and on St. George, in the place of the squalid, filthy habitations of the immediate past, two villages, neat, warm, and contented. Each family lives in a snug frame dwelling; every house is lined with tarred paper, painted, furnished with a stove, with outhouses, etc., complete; streets laid out, and the foundations of these habitations regularly plotted thereon. There is a large church at St. Paul, and a less pretentious but very creditable structure of the same character on St. George; a hospital on St. Paul, with a full and complete stock of drugs, and skilled physicians on both islands to take care of the people, free of cost. There is a schoolhouse on each island, in which teachers are also paid by the company eight months in the year, to instruct the youth, while the Russian Church is sustained entirely by the pious contributions of the natives themselves on these two islands, and sustained well by each other. There are 80 families, or 80 houses, on St. Paul, in the village, with 20 or 24 such houses to as many families at St. George, and 8 other structures. The large warehouses and salt sheds of the Alaska Commercial Company, built by skillful mechanics, as have been the dwellings just referred to, are also neatly painted; and, taken in combination with the other features, constitute a picture fully equal to the average presentation of any one of our small eastern towns. There is no misery, no downcast, dejected, suffering humanity here to-day. These Aleuts, who enjoy as the price of their good behavior the sole right to take and skin seals for the company, to the exclusion of all other people, are known to and by their less fortunate neighbors elsewhere in Alaska as the "Bogatskie Aloutov," or the "rich Aleuts." The example of the agents of the Alaska Commercial Company, on both islands, from the beginning of its lease, and the course of the Treasury agents[1] during the last four or five years, have been silent but powerful promoters of the welfare of these people. They have maintained perfect order; they have directed neatness and cleanliness, and stimulated industry, such as those natives had never before dreamed of.

NUMBER AND CONDITION OF THE ISLANDERS IN 1880.—The population of St. Paul is, at the present writing, 298. Of these, 14 are whites (13 males and 1 female), 128 male Aleutians, and 156 females. On St. George we have 92 souls: 4 white males, 35 male Aleutians, and 53 females, a total population on these islands of 390. This is an increase of between 30 and 40 people since 1873. Prior to 1873, they had neither much increased nor diminished for 50 years, but would have fallen off rapidly (for the births were never equal to the deaths) had not recruits been regularly drawn from the mainland and other islands every season when the ships came up. As they lived then, it was a physical impossibility for them to increase and multiply; but, since their elevation and their sanitary advancement are so marked, it may be reasonably expected that those people for all time to come will at least hold their own, even though they do not increase to any remarkable degree. Perhaps it is better that they

[1] Messrs. Morton, Falconer, Otis, Moulton, Scribner, and Beeman.

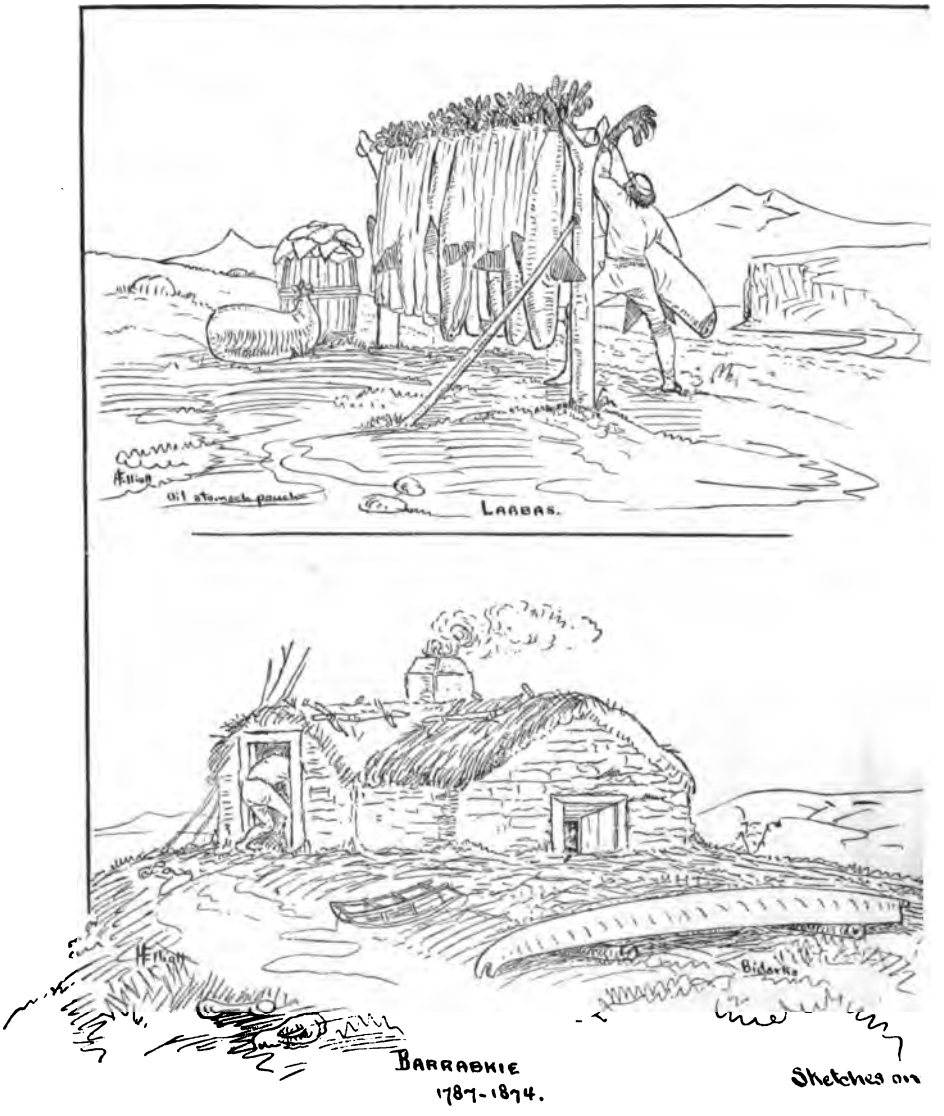
should not. But it is exceedingly fortunate that they do sustian themselves so as to be, as it were, a prosperous corporate factor, entitled to the exclusive privilege of labor on these islands. As an encouragement for their good behavior the Alaska Commercial Company, in pursuance of its enlightened treatment of the whole subject, so handsomely exhibited by its housing of these people, has assured them that so long as they are capable and willing to perform the labor of skinning the seal catch every year, so long will they enjoy the sole privilege of participating in that toil and its reward. This is wise on the part of the company, and it is exceedingly happy for the people. They are, of all men, especially fitted for the work connected with the seal business—no comment is needed—nothing better in the way of manual labor, skilled and rapid, could be rendered by any body of men, equal in numbers, living under the same circumstances, all the year round. They appear to shake off the periodic lethargy of winter and its forced inanition, to rush with the coming of summer into the severe exercise and duty of capturing, killing, and skinning the seals, with vigor and with persistent and commendable energy.

To-day only a very small proportion of the population are descendants of the pioneers who were brought here by the several Russian companies in 1787 and 1788; a colony of 137 souls, it is claimed, principally recruited at Unalaska and Atkha. I have placed in the appendix, together with other scattered notes, a list of these people who were living on St. Paul Island in August, 1873; also showing at the same time those who were living there in 1870. It is a simple record, perhaps of no interest to anybody except those who are intimately associated with the islands. (See note, 39, F.)

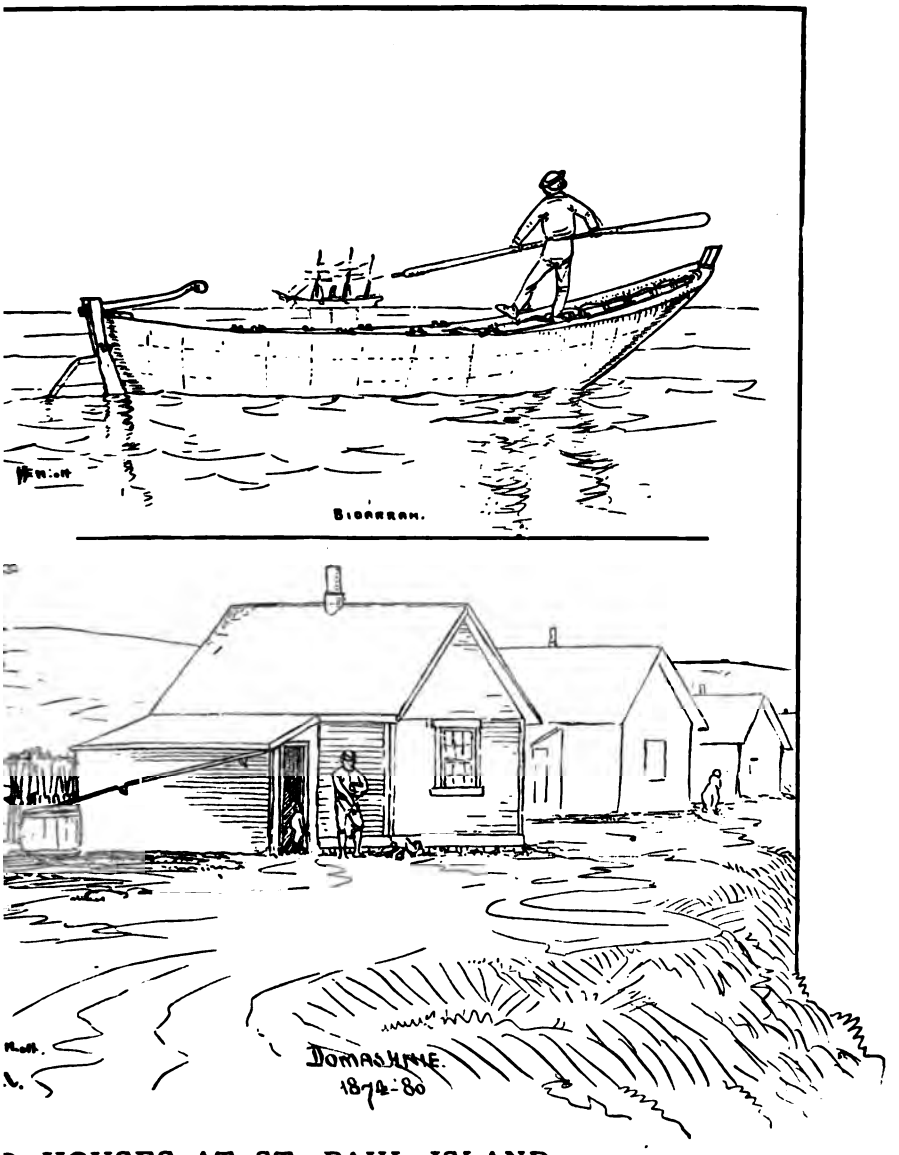
ORIGIN AND TRAITS OF THE ALEUTS.—The question as to the derivation of these natives is a still mooted one among ethnologists, for in all points of personal bearing, intelligence, character, as well as physical structure, they seem to form a perfect link of gradation between the Japanese and Eskimos, although their traditions and their language are entirely distinct and peculiar to themselves. Not one word or numeral of their nomenclature resembles the dialect of either. They claim, however, to have come first to the Aleutian Islands from a "big land to the westward," and that when they came there first they found the land uninhabited, and that they did not meet with any people, until their ancestors had pushed on to the eastward as far as the peninsula and Kadiak. Confirmatory of this legend, or rather highly suggestive of it, is the fact that repeated instances have occurred within our day where Japanese junks have been, in the stress of hurricanes and typhoons, dismantled, and have drifted clear over and on to the reefs and coasts of the Aleutian Islands. Only a short time ago, in the summer of 1871, such a craft was so stranded, helpless and at the mercy of the sea, upon the rocky coast of Adak Island, in this chain. The few surviving sailors, Japanese, five in number, were, I remember, rescued by a party of Aleutian sea-otter hunters, who took care of them until the vessel of a trader carried them back, by way of Unalaska, to San Francisco, and from thence they returned to their native land.

The Aleuts on the islands, as they appear to-day, have been so mixed up with Russian, Koloshian, and Kamschadale blood, that they present characteristics, in one way or another, of all the various races of men, from the negro up to the Caucasian. The predominant features among them are small, wide-set eyes, broad and high cheek bones, causing the jaw, which is full and square, to often appear peaked; coarse, straight,

Plate II.



SEAL-MEAT FRAME, LIGHTER, HUT,



D HOUSES AT ST. PAUL ISLAND.

black hair, small, neatly shaped feet and hands, together with brownish-yellow complexion. The men will average in stature 5 feet 4 or 5 inches; the women less in proportion, although there are exceptions to this rule among them, some being over 6 feet in height, and others are decided dwarfs. The manners and customs of these people to-day possess nothing in themselves of a barbarous or remarkable character, aside from that which belongs to an advanced state of semicivilization. They are exceedingly polite and civil, not only in their business with the agents of the company on the seal islands, but among themselves and they visit, the one with the other, freely and pleasantly, the women being great gossips. But, on the whole, their intercourse is subdued, for the simple reason that the topics of conversation are few, and, judging from their silent but unconstrained meetings, they seem to have a mutual knowledge, as if by sympathy, as to what may be occupying each other's minds, rendering speech superfluous. It is only when under the influence of beer or strong liquor that they lose their naturally quiet and amiable disposition. They then relapse into low, drunken orgies and loud, brawling noises. Having been so long under the control and influence of the Russians, they have adopted many Sclavic customs, such as giving birthday dinners, naming their children, etc. They are remarkably attached to their church, and no other form of religion could be better adapted to or have a firmer hold upon the sensibilities of the people. Their inherent chastity and sobriety can not be commended. They have long since thrown away the uncouth garments of the Russian rule—the shaggy dog-skin caps, with coats half seal and half sea lion—for a complete outfit cap-a-pie, such as our own people buy in any furnishing house; the same boots, socks, underclothing, and clothing, with ulsters and ulsterettes; but the violence of the wind prevents their selecting the hats of our haut ton and sporting fraternity. As for the women, they too have kept pace and even advanced to the level of the men, for in these lower races there is much more vanity displayed by the masculine element than the feminine, according to my observation. In other words, I have noticed a greater desire among the young men than among the young women of savage and semicivilized people to be gaily dressed and to look fine. But the visits of the wives of our Treasury officials and the company's agents to these islands during the last ten years, bringing with them a full outfit, as ladies always do, of everything under the sun that women want to wear, has given the native female mind an undue expansion up there and stimulated it to unwonted activity. They watch the cut of the garments and borrow the patterns, and some of them are very expert dressmakers to-day. When the Russians controlled affairs, the women were the hewers of the driftwood and the drawers of the water. At St. Paul there was no well of drinking fluid about the village, nor within half a mile of the village; there was no drinking water unless it was caught in cisterns, and the cistern water, owing to the particles of seal-fat soot which fall upon the roofs of the houses, is rendered undrinkable, so that the supply for the town, until quite recently, used to be carried by the women from two little lakes at the head of the lagoon, a mile and a half, as the crow flies, from the village, and right under Telegraph Hill. This is quite a journey, and when it is remembered that they drink so much tea, and that water has to go with it, some idea of the labor of the old and young females can be derived from an inspection of the map. Latterly, within the last four or five years, the company have opened a spring less than half a mile from the "gorode," which

they have plumbed and regulated, so that it supplies them with water now and renders the labor next to nothing, compared with the former difficulty. But to-day, when water is wanted in the Aleutian houses at St. Paul, the man has to get it; the woman does not. He trudges out with a little wooden firkin or tub on his back and brings it to the house.

Some of the natives save their money, but there are very few among them, perhaps not more than a dozen, who have the slightest economical tendency. What they can not spend for luxuries, groceries, and tobacco they manage to get away with at the gaming table. They have their misers and their spendthrifts, and they have the usual small proportion who know how to make money and then how to spend it. A few among them who are in the habit of saving have opened a regular bank account with the company. Some of them have to-day two or three thousand dollars saved, drawing an interest of 9 per cent.

When the ships arrive and go the great and necessary labor of lightering their cargoes off and on from the roadsteads where they anchor is principally performed by these people, and they are paid so much a day for their labor—from 50 cents to $1, according to the character of the service they render. This operation, however, is much dreaded by the ship captains and sea-going men, whose habits of discipline and automatic regularity and effect of working render them severe critics and impatient coadjutors of the natives, who, to tell the truth, hate to do anything after they have pocketed their reward for sealing, and when they do labor after this, they regard it as an act of very great condescension on their part.

As they are living to-day up there there is no restraint, such as the presence of policemen, courts of justice, fines, etc., which we employ for the suppression of disorder and maintenance of the law in our own land. They understand that if it is necessary to make them law-abiding and to punish crime that such officers will be among them; and hence, perhaps, is due the fact that, from the time that the Alaska Commercial Company has taken charge, in 1870, there has not been one single occasion where the simplest functions of a justice of the peace would or could have been called in to settle any difficulty. This speaks eloquently for their docile nature and their amiable disposition.

FOOD.—Seal meat is their staple food, and in the village of St. Paul they consume on an average fully 500 pounds a day the year round; and they are, by the permission of the Secretary of the Treasury, allowed every fall to kill 5,000 or 6,000 seal pups, or an average of 22 to 30 young "kotickie" for each man, woman, and child in the settlements. The pups will dress 10 pounds each. This shows an average consumption of nearly 600 pounds of seal meat by each person, large and small, during the year. To this diet the natives add a great deal of butter and many sweet crackers. They are passionately fond of butter. No epicure at home or butter taster in Goshen knows or appreciates that article better than these people do. If they could get all that they desire, they would consume 1,000 pounds of butter and 500 pounds of sweet crackers every week, and indefinite quantities of sugar. The sweetest of all sweet teeth are found in the jaw of the average Aleut. But it is, of course, unwise to allow them full swing in this matter, for they would turn their stomachs into fermenting tanks if they had full access to an unlimited supply of saccharine food. The company allows them 200 pounds a week. If unable to get sweet crackers, they will eat about 300 pounds of hard or pilot bread every week, and in addition to this nearly 700 pounds

of flour at the same time. Of tobacco they are allowed 50 pounds per week; candles, 75 pounds; rice, 50 pounds. They burn, strange as it may seem, kerosene oil here to the exclusion of the seal fat, which literally overruns the island. They ignite and consume over 600 gallons of kerosene oil a year in the village of St. Paul alone. They do not fancy vinegar very much; perhaps 50 gallons a year is used up there. Mustard and pepper are sparingly used, 1 to 1½ pounds a week for the whole village. Beans they peremptorily reject; for some reason or other they can not be induced to use them. Those who go about the vessels contract a taste for split-pea soup, and a few of them are sold in the village store. Salt meat, beef or pork, they will take reluctantly if it is given to and pressed upon them, but they will never buy it. I remember, in this connection, seeing two barrels of prime salt pork and a barrel of prime mess salt beef opened in the company's store shortly after my arrival in 1872, and, though the people of the village were invited to help themselves, I think I am right in saying that the barrels were not emptied when I left the island in 1873. They use very little coffee during the year—not more than 100 pounds—but of tea a great deal. I do not know exactly—I can not find among my notes a record as to this article—but I can say that they do not drink less than a gallon of tea apiece per diem. The amount of this beverage which they sip from the time they rise in the morning until they go to bed late at night is astounding. Their "samovars," and latterly the regular teakettles of our American make, are bubbling and boiling from the moment the housewife stirs herself at daybreak until the fire goes out when they sleep. It should be stated in this connection that they are supplied with a regular allowance of coal every year by the company gratis, each family being entitled to a certain amount, which alone, if economically used, keeps them warm all winter in their new houses; but for those who are extravagant and are itching to spend their extra wages an extra supply is always kept in the storehouses of the company for sale. Their appreciation of and desire to possess all the canned fruit that is landed from the steamer is marked to a great degree. If they had the opportunity, I doubt whether a single family on that island to-day would hesitate to bankrupt itself in purchasing this commodity. Potatoes they sometimes demand, as well as onions, and perhaps if these vegetables could be brought here and kept to an advantage the people would soon become very fond of them. (See note, 39, G.)

OCCUPATION.—The question is naturally asked: How do these people employ themselves during the long nine months of every year, after the close of the sealing season and until it begins again, when they have little or absolutely nothing to do? It may be answered, that they simply vegetate; or, in other words, are entirely idle, mentally and physically, during most of this period. But to their credit let it be said, that mischief does not employ their idle hands; they are passive killers of time, drinking tea and sleeping, with a few disagreeable exceptions, such as the gamblers. There are a half dozen of these characters at St. Paul, and perhaps as many at St. George, who pass whole nights at their sittings, even during the sealing season, playing games of cards, taught by Russians and persons who have been on the island since the transfer of the Territory; but the majority of the men, women, and children, not being compelled to exert themselves to obtain any of the chief, or even the least of the necessaries of life, such as tea and hard bread, sleep the greater portion of the time, when not busy in eating and in the daily observ-

ances of the routine belonging to the Greek Catholic Church. The teachings, pomp, and circumstance of the religious observances of this faith alone preserve these people from absolute stagnation. In obedience to its teachings they gladly attend church very regularly. They also make and receive calls on their saints' days, and these days are very numerous. I think some 290 days of the whole year's calendar must be given up to the ceremonies attendant upon the celebration of some holy man's or woman's birth or death.

In early times the same disgraceful beer-drinking orgies, which prevailed to so great an extent and still cause so much misery and confusion seen elsewhere in the Territory, prevailed here, and I remember very well the difficulty which I had in initiating the first steps taken by the Treasury Department to suppress this abominable nuisance. During the last four or five years, it gives me pleasure to say, since the new order of things was inaugurated, the present agents of the Department have faithfully executed the law.

The natives add to these entertainments of their saints' day and birth festivals, or "emannimiks," the music of accordians and violins. Upon the former, and its variation the concertina, they play a number of airs, and are very fond of the noise. A great many of the women, in particular, can render indifferently a limited selection of tunes, many of which are the old battle songs, so popular during the rebellion, woven into weird Russian waltzes and love ditties, which they have jointly gathered from their former masters and our soldiers who were quartered here in 1869. From the Russians and the troops also they have learned to dance various figures and have been taught to waltz. These dances, however, the old folks do not enjoy very much. They will come in and sit around and look at the young performers with stolid indifference; but if they manage to get a strong current of tea setting in their direction, nicely sugared and toned up, they revive and join in the mirth. In old times they never danced here unless they were drunk, and it was the principal occupation of the amiable and mischievous Treasury agents and others in the early days to open up this beery fun. Happily that nuisance is abated.

As an illustration of their working ability on the seal grounds I offer the following, which shows the actual time occupied by them in finishing up the three seasons' work which I personally supervised:

On St. Paul Island: In 1872, fifty days' work of 71 men secured 75,000 seal skins; in 1873, forty days' work of 71 men secured 75,000 seal skins; in 1874, thirty-nine days' work of 84 men secured 90,000 seal skins.

This exhibit plainly presents the increased ability and consequent celerity of action among the natives, and furnishes also at the same time abundant proof of the statement which I make of the full and undiminished supply of killable seals, or "holluschickie," from year to year.

THE INFLUENCE OF THE ALASKA COMMERCIAL COMPANY.—Before leaving the consideration of these people, who are so intimately associated with and blended into the business on these islands, it may be well to clearly define the relation existing between them, the Government, and the company leasing the islands. When Congress granted to the Alaska Commercial Company of San Francisco the exclusive right of taking a certain number of fur seals every year for a period of twenty years on these islands, it did so with several reservations and conditions which were confided in their detail to the Secretary of the Treasury. This officer and the president of the Alaska Commer-

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Plate III.

TYPICAL DRESS

Ordinary attire of men on the killing-grounds.

'RIBYLOV NATIVES.

Ordinary attire of women and young children in the villages.

cial Company agreed upon a code of regulations which should govern their joint action in regard to the natives. It was a simple agreement that these people should have a certain amount of dried salmon furnished them for food every year, a certain amount of fuel, a schoolhouse, and the right to go to and come from the islands as they chose, and also the right to work or not, understanding that in case they did not work their places would and could be supplied by other people who would work.

The company, however, has gone far beyond this exaction of the Government. It has added the inexpressible boon of comfort in the formation of the dwellings now occupied by the natives, which was not expressed nor thought of at the time of the granting of the lease. An enlightened business policy suggested to the company that it would be much better for the natives and much better for the company, too, if these people were taken out of their filthy, unwholesome hovels, put into habitable dwellings, and taught to live cleanly, for the simple reason that by so doing the natives, living in this improved condition, would be able physically and mentally every season when the sealing work began to come out from their long inanition and go to work at once with vigor and energetic persistency. The sequel has proved the wisdom of the company.

Before this action on their part it was physically impossible for the inhabitants of St. Paul or St. George islands to take the lawful quota of 100,000 seal skins annually in less than three or four working months. They take them in less than thirty working days now with the same number of men. What is the gain? Simply this, and it is everything: The fur-seal skin, from the 14th of June, when it first arrives, as a rule, up to the 1st of August, is in prime condition; from that latter date until the middle of October it is rapidly deteriorating, to slowly appreciate again in value as it sheds and renews its coat; so much so that it is practically worthless in the markets of the world. Hence, the catch taken by the Alaska Commercial Company every year is a prime one, first to last—there are no low-grade "stagy" skins in it; but under the old regimen three-fourths of the skins were taken in August, in September, and even in October, and were not worth their transportation to London. Comment on this is unnecessary. It is the contrast made between a prescient business policy and one that was as shiftless and improvident as language can well devise.

SCHOOLS AND CHURCHES.—The company found so much difficulty in getting the youth of the villages to attend their schools, taught by our own people, especially brought up there and hired by the company, that they have adopted the plan of bringing one or two of the brightest boys down every year and putting them into our schools, so that they may grow up here and be educated, in order to return and serve as teachers there. This policy is warranted by the success attending the experiment made at the time when I was up there first, whereby a son of the chief was carried down and over to Rutland, Vt., for his education, remained there four years, then returned and took charge of the school on St. Paul, which he has had ever since, with the happiest results in increased attendance and attention from the children. But, of course, so long as the Russian church service is conducted in the Russian language we will find on the islands more Russian-speaking people than our own. The nonattendance at school was not and is not to be ascribed to indisposition on the part of the children and parents. One of the oldest and most intelligent of the natives told me, explanatory of their feeling and consequent

action, that he did not, nor did his neighbors, have any objection to the attendance of their children on our English school; but, if their boys and young men neglected their Russian lessons, they knew not who were going to take their places, when they died, in his church, at the christenings, and at their burial. To anyone familiar with the teachings of the Greek-Catholic faith, the objection of old Philip Volkov seems reasonable. I hope, therefore, that, in the course of time, the Russian church service may be voiced in English; not that I want to substitute any other religion for it—far from it; in my opinion it is the best one we could have for these people—but until this substitution of our language for the Russian is done no very satisfactory work, in my opinion, will be accomplished in the way of an English education on the seal islands.

The fact that among all the savage races found on the northwest coast by Christian pioneers and teachers the Aleutians are the only practical converts to Christianity goes far, in my opinion, to set them apart as very differently constituted in mind and disposition from our Indians and our Eskimos of Alaska. To the latter, however, they seem to be intimately allied, though they do not mingle in the slightest degree. They adopted the Christian faith with very little opposition, readily exchanging their barbarous customs and wild superstitions for the rites of the Greek-Catholic Church and its more refined myths and legends.

At the time of their first discovery they were living as savages in every sense of the word, bold and hardy, throughout the Aleutian chain, but now they respond, on these islands, to all outward signs of Christianity, as sincerely as our own church-going people.

THE ALASKA COMMERCIAL COMPANY.

OCCUPATION OF THE ISLANDS BY AMERICANS IN 1868.—The Alaska Commercial Company deserves and will receive a brief but comprehensive notice at this point. In order that we may follow it to these islands and clearly and correctly appreciate the circumstances which gave it footing and finally the control of the business, I will pass back and review the chain of evidence adduced in this direction from the time of our first occupation, in 1867, of the Territory of Alaska.

It will be remembered by many people that when we were ratifying the negotiation between our Government and that of Russia it was made painfully apparent that nobody in this country knew anything about the subject of Russian America. Every schoolboy knew where it was located, but no professor or merchant, however wise or shrewd, knew what was in it. Accordingly, immediately after the purchase was made and the formal transfer effected a large number of energetic and speculative men, some coming from New England even, but most of them residents of the Pacific Coast, turned their attention to Alaska. They went to Sitka in a little fleet of sail and steam vessels, but among their number it appears there were only two of our citizens who knew of or had the faintest appreciation as to the value of the seal islands. One of these, Mr. H. M. Hutchinson, a native of New Hampshire, and the other, a Capt. Ebenezer Morgan, a native of Connecticut, turned their faces in 1868 toward them. Mr. Hutchinson gathered his information at Sitka; Captain Morgan had gained his years before by experience on the South Sea sealing grounds. Mr. Hutchinson represented a company of San Francisco or California capitalists when he landed on St. Paul; Captain Morgan represented another company of New

London capitalists and whaling merchants. They arrived almost simultaneously, Morgan a few days or weeks anterior to Hutchinson. He had quietly enough commenced to survey and preempt the rookeries on the islands, or, in other words, the work of putting stakes down and recording the fact of claiming the ground, as miners do in the mountains; but later agreed to cooperate with Mr. Hutchinson. These two parties passed that season of 1868 in exclusive control of those islands, and they took an immense number of seals. They took so many that it occurred to Mr. Hutchinson unless something was done to check and protect these wonderful rookeries, which he saw here for the first time, and which filled him with amazement, that they would be wiped out by the end of another season. Although he was the gainer then, and would be perhaps at the end, if they should be thus eliminated, yet he could not forbear saying to himself that it was wrong and should not be. To this Captain Morgan also assented.

ORGANIZATION OF THE ALASKA COMMERCIAL COMPANY.—In the fall of 1868 Mr. Hutchinson and Captain Morgan, by their personal efforts, interested and aroused the Treasury Department and Congress, so that a special resolution was enacted declaring the seal islands a governmental reservation, and prohibiting any and all parties from taking seals thereon until further action by Congress. In 1869 seals were taken on those islands, under the direction of the Treasury Department, for the subsistence of the natives only; and in 1870 Congress passed the present law, a copy of which I append, for the protection of the fur-bearing animals on those islands, and under its provisions, and in accordance therewith, after an animated and bitter struggle in competition, the Alaska Commercial Company, of which Mr. Hutchinson was a prime organizer, secured the award and received the franchise which it now enjoys and will enjoy for another decade. The company is an American corporation, with a charter, rules, and regulations, which I reproduce in the appendix to this memoir. They employ a fleet of vessels, sail and steam—four steamers, a dozen or fifteen ships, barks, and sloops. Their principal occupation and attention is given naturally to the seal islands, though they have stations scattered over the Aleutian Islands and that portion of Alaska west and north of Kadiak. No post of theirs is less than 500 or 600 miles from Sitka.

Outside of the seal islands all trade in this Territory of Alaska is entirely open to the public. There is no need of protecting the fur-bearing animals elsewhere, unless it may be by a few wholesome general restrictions in regard to the sea-otter chase. The country itself protects the animals on the mainland and other islands by its rugged, forbidding, and inhospitable exterior.

The Treasury officials on the seal islands are charged with the careful observance of every act of the company; a copy of the lease and its covenant is conspicuously posted in their office; is translated into Russian, and is familiar to all the natives. The company directs its own labor, in accordance with the law, as it sees fit; selects its time of working, etc. The natives themselves work under the direction of their own chosen foreman, or "toyone." These chiefs call out the men at the break of every working day, divide them into detachments according to the nature of the service, and order their doing. All communication with the laborers on the sealing ground and the company passes through their hands, these chiefs having every day an understanding with the agent of the company as to his wishes, and they govern themselves thereby.

BUSINESS METHODS.—The company pays 40 cents for the labor of taking each skin. The natives take the skins on the ground; each man tallying his work and giving the result at the close of the day to his chief or foreman. When the skins are brought up and counted into the salt houses, where the agent of the company receives them from the hands of the natives, the two tallies usually correspond very closely, if they are not entirely alike. When the quota of skins is taken, at the close of two, three, or four weeks of labor, as the case may be, the total sum for the entire catch is paid over in a lump to the chiefs, and these men divide it among the laborers according to their standing as workmen, which they themselves have exhibited on their special tally sticks. For instance, at the annual divisions, or "catch" settlement, made by the natives on St. Paul Island among themselves, in 1872, when I was present, the proceeds of their work for that season in taking and skinning 75,000 seals, at 40 cents per skin, with extra work connected with it, making the sum of $30,637.37, was divided among them in this way: There were 74 shares made up, representing 74 men, though in fact only 56 men worked, but they wished to give a certain proportion to their church, a certain proportion to their priests, and a certain proportion to their widows; so they water their stock, commercially speaking. The 74 shares were proportioned as follows:

	Each.
37 first-class shares, at	$451.22
23 second-class shares, at	406.08
4 third-class shares, at	360.97
10 fourth-class shares, at	315.85

These shares do not represent more than 56 able-bodied men.

In August, 1873, while on St. George Island, I was present at a similar division, under similar circumstances, which caused them to divide among themselves the proceeds of their work in taking and skinning 25,000 seals, at 40 cents a skin, $10,000. They made the following subdivision:

	Per share.
17 shares each, 961 skins	$384.40
2 shares each, 935 skins	374.00
3 shares each, 821 skins	328.40
1 share each, 820 skins	328.00
3 shares each, 770 skins	308.00
3 shares each, 400 skins	160.00

These 29 shares referred to represent only 25 able-bodied men; 2 of them were women. This method of division, as above given, is the result of their own choice. It is an impossible thing for the company to decide their relative merits as workmen on the ground, so they have wisely turned its entire discussion over to them. Whatever they do they must agree to—whatever the company might do they possibly and probably would never clearly understand, and hence dissatisfaction and suspicion would inevitably arise; as it is, the whole subject is most satisfactorily settled.

THE BUSINESS CONCERNED.

THE METHODS OF THE ALASKA COMMERCIAL COMPANY.—Living as the seal islanders do, and doing what they do, the seal's life is naturally their great study and objective point. It nourishes and sustains them. Without it they say they could not live, and they tell the truth. Hence their attention to the few simple requirements of the

law, so wise in its provisions, is not forced or constrained, but is continuous. Self-interest in this respect appeals to them keenly and eloquently. They know everything that is done and everything that is said by anybody and by everybody in their little community. Every seal drive that is made and every skin that is taken is recorded and accounted for by them to their chiefs and their church when they make up their tithing roll at the close of each day's labor. Nothing can come to the islands by day or by night without being seen by them and spoken of. I regard the presence of these people on the islands at the transfer and their subsequent retention and entailment in connection with the seal business as an exceedingly good piece of fortune, alike advantageous to the Government, to the company, and to themselves.

It will be remembered that at the time the question of leasing the islands was before Congress much opposition to the proposal was made on several grounds by two classes, one of which argued against a "monopoly," the other urging that the Government itself would realize more by taking the whole management of the business into its own hands. At that time far away from Washington, in the Rocky Mountains, I do not know what arguments were used in the committee rooms or who made them, but since my careful and prolonged study of the subject on the ground itself and of the trade and its conditions I am now satisfied that the act of June, 1870, directing the Secretary of the Treasury to lease the seal islands of Alaska to the highest bidder, under the existing conditions and qualifications, did the best and the only correct and profitable thing that could have been done in the matter, both with regard to the preservation of the seal life in its original integrity and the pecuniary advantage of the Treasury itself. To make this statement perfectly clear the following facts, by way of illustration, should be presented:

First. When the Government took possession of these interests, in 1868 and 1869, the gross value of a seal skin laid down in the best market, at London, was less in some instances and in others but slightly above the present tax and royalty paid upon it by the Alaska Commercial Company.

Second. Through the action of the intelligent business men who took the contract from the Government in stimulating and encouraging the dressers of the raw material and in taking sedulous care that nothing but good skins should leave the islands, and in combination with leaders of fashion abroad, the demand for the fur, by this manipulation and management, has been wonderfully increased.

Third. As matters now stand the greatest and best interests of the lessees are identical with those of the Government; what injures one instantly injures the other. In other words, both strive to guard against anything that shall interfere with the preservation of the seal life in its original integrity and both having it to their interest, if possible, to increase that life. If the lessees had it in their power, which they certainly have not, to ruin these interests by a few seasons of rapacity they are so bonded and so environed that prudence prevents it.

Fourth. The frequent changes in the office of the Secretary of the Treasury, who has very properly the absolute control of the business as it stands, do not permit upon his part that close, careful scrutiny which is exercised by the lessees, who, unlike him, have but their one purpose to carry out. The character of the leading men among them is enough to assure the public that the business is in responsible hands and in the care of persons who will use every effort for its preservation and its perpetuation, as it is so plainly their best end to serve.

Another great obstacle to the success of the business if controlled entirely by the Government would be encountered in disposing of the skins after they had been brought down from the islands. It would not do to sell them up there to the highest bidder, since that would license the sailing of a thousand ships to be present at the sale. The rattling of their anchor chains and the scraping of their keels on the beaches of the two little islands would alone drive every seal away and over to the Russian grounds in a remarkably short space of time. The Government would therefore need to offer them at public auction in this country, and it would be simply history repeating itself—the Government would be at the mercy of any well-organized combination of buyers. The agents conducting the sale could not counteract the effect of such a combination as can the agents of a private corporation, who may look after their interest in all the markets of the world in their own time and in their own way, according to the exigencies of the season and the demand, and who are supplied with money which they can use, without public scandal, in the manipulation of the market. On this ground I feel confident in stating that the Treasury of the United States receives more money, net, under the system now in operation, than it would by taking the exclusive control of the business. Were any capable Government officer supplied with, say, $100,000, to expend in "working the market," and intrusted with the disposal of 100,000 seal skins wherever he could do so to the best advantage of the Government, and were this agent a man of first-class business ability and energy, I think it quite likely that the same success might attend his labor in the London market that distinguishes the management of the Alaska Commercial Company. But imagine the cry of fraud and embezzlement that would be raised against him, however honest he might be. This alone would bring the whole business into positive disrepute, and make it a national scandal. As matters are now conducted there is no room for any scandal—not one single transaction on the islands but what is as clear to investigation and accountability as the light of the noonday sun; what is done is known to everybody, and the tax now laid by the Government upon and paid into the Treasury every year by the Alaska Commercial Company yields alone a handsome rate of interest on the entire purchase money expended for the ownership of all Alaska.

It is frequently urged with great persistency by misinformed or malicious authority that the lessees can and do take thousands of skins in excess of the law, and this catch in excess is shipped *sub rosa* to Japan from the Pribilof Islands. To show the folly of such a move on the part of the company, if even it were possible, I will briefly recapitulate the conditions under which the skins are taken. The natives of St. Paul and St. George do themselves, in the manner I have indicated, all the driving and skinning of the seals for the company. No others are permitted or asked to land upon the islands to do this work, so long as the inhabitants of the islands are equal to it. They have been equal to it and are more than equal to it. Every skin taken by the natives is counted by themselves, as they get 40 cents per pelt for that labor, and at the expiration of each day's work in the field the natives know exactly how many skins have been taken by them, how many of these skins have been rejected by the company's agent because they were carelessly cut and damaged in skinning—usually about three-fourths of 1 per cent of the whole catch—and they have it recorded every evening by those among them who are charged with the duty. Thus were 101,000 skins taken, instead of

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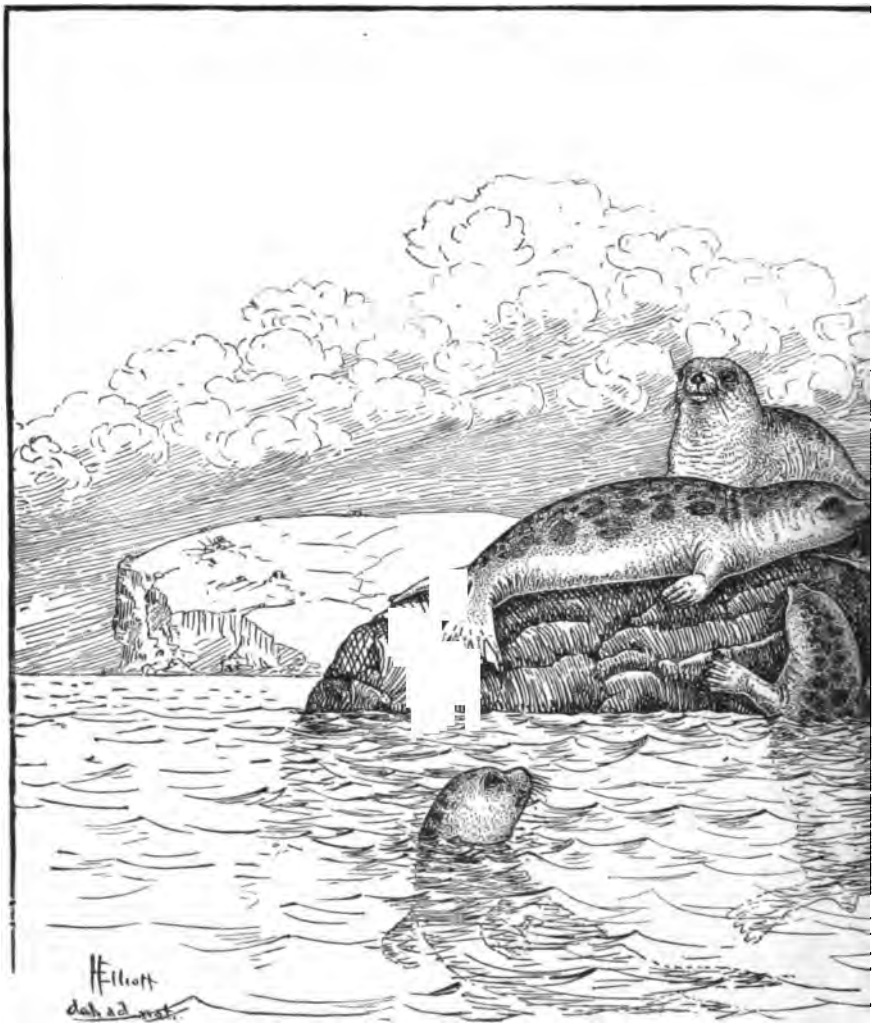
Plate IV.



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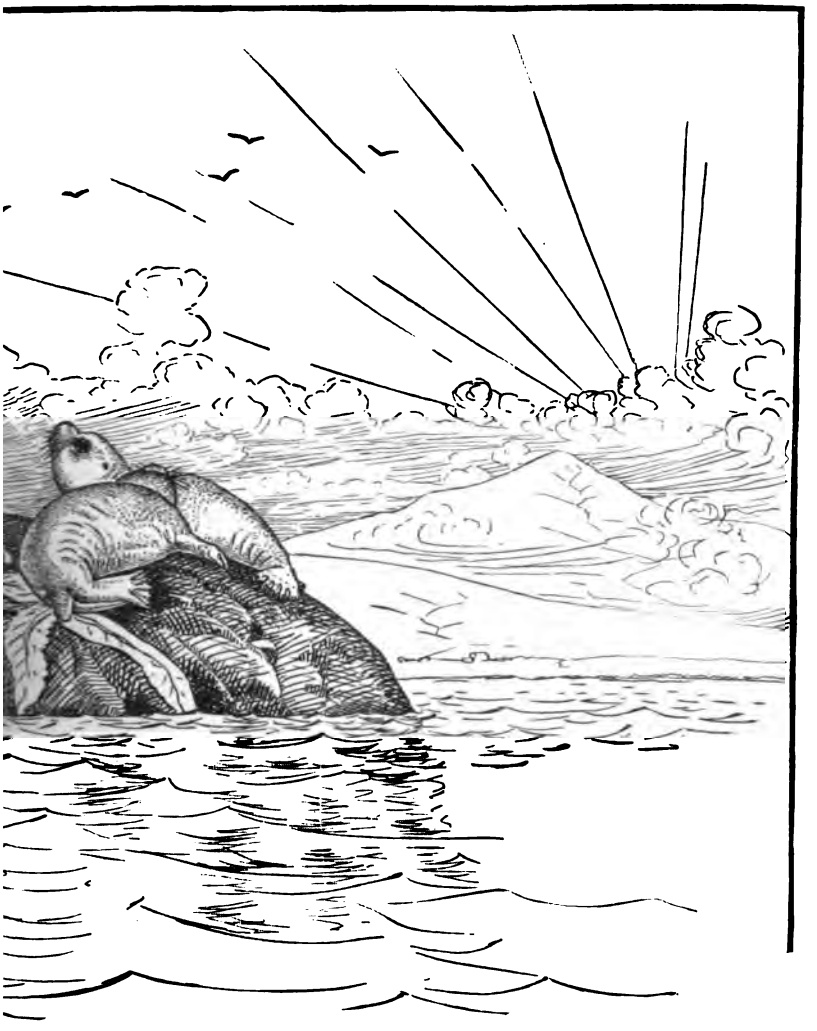
(Phoca vitulina: mal

A life-study by the author: Zapad



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ale, and young.)

ul Island, June 20, 1872.

100,000 allowed by law, the natives would know it as quickly as it was done, and they would, on the strength of their record and their tally, demand the full amount of their compensation for the extra labor, and were any ship to approach the islands at any hour these people would know it at once, and would be aware of any shipment of skins that might be attempted. It would then be the common talk among the 398 inhabitants of the two islands, and it would be a matter of record, open to any person who might come upon the ground charged with investigation. (See note, 39, L.)

Furthermore, these natives are constantly going to and from Unalaska, visiting their relations in the Aleutian settlements, hunting for wives, etc. On the mainland they have intimate intercourse with bitter enemies of the company, with whom they would not hesitate to talk over the whole state of affairs on the islands, as they always do, for they know nothing else and think of nothing else and dream of nothing else. Therefore, should anything be done contrary to the law, the act could and would be reported by these people. The Government, on its part, through its four agents stationed on these islands, counts these skins into the ship, and one of their number goes down to San Francisco upon her. There the collector of the port details experts of his own, who again count them all out of the hold, and upon that record the tax is paid and the certificate signed by the Government.

It will, therefore, at once be seen, by examining the state of affairs on the islands and the conditions upon which the lease is granted, that the most scrupulous care in fulfilling the terms of the contract is compassed, and that this strict fulfillment is the most profitable course for the lessees to pursue; and that it would be downright folly in them to deviate from the letter of the law and thus lay themselves open at any day to discovery, the loss of their contract, and forfeiture of their bonds. Their action can be investigated at any time, any moment, by Congress, of which they are fully aware. They can not bribe these 398 people on the islands to secrecy any more successfully than they could conceal their action from them on the sealing fields; and any man of average ability could go, and can go, among these natives and inform himself as to the most minute details of the catch from the time the lease was granted up to the present hour, should he have reason to suspect the honesty of the Treasury agents. The road to and from the islands is not a difficult one, though it is traveled only once a year.

The subject of the method and direction of the business of sealing on these islands, involving as it does a discussion of the law and the action of the Alaska Commercial Company and the natives combined, will form a thesis for another chapter.

THE HAIR SEAL.

ENUMERATION OF THE VARIOUS SPECIES OF SEALS.—The history of the fur seal, the one overshadowing and superlatively interesting subject of this discussion, I shall present in all its multitudinous details, even at the risk of being thought tedious. The aggregate of animal life shadowed every summer out upon the breeding grounds of the seal islands is so vast, so anomalous, so interesting, and so valuable, that it deserves the fullest mention; and even when I shall have done it will be but feebly expressed.

The seal life on the Pribilof Islands may be classified under the

following heads, namely: (1) The fur seal, *Callorhinus ursinus*, the "kautickie" of the Russians; (2) the sea lion, *Eumetopias stelleri*, the "seevitchie" of the Russians; (3) the hair seal, *Phoca vitulina*, the "nearhpahsky" of the Russians; (4) the walrus, *Odobœnus obesus*, the "morsjee" of the Russians.

THE HAIR SEAL.—The above short schedule embraces the titles of all the pinnipeds found in, on, and around the island group. Of this list the hair seal is the animal which has done so much to found that erroneous, popular, and scientific opinion as to what a fur seal appears like. *Phoca vitulina* has in this manner given to the people of the world a false idea of its relatives. It is so commonly distributed all over the littoral salt waters of the earth, seen in the harbors of nearly every marine port, or basking along the loneliest and least inhabited of desolate coasts far to the north, that everybody has noticed it, if not in life, then in its stuffed skins at the museums, sometimes very grotesquely stuffed. This copy, set everywhere before the eye of the naturalist, has rendered it so difficult for him to correctly discriminate between the *Phocidæ* and the *Otariidæ*, that the synonymy of the *Pinnipedia* has been expanded until it is replete with meaningless description and surmise.

Although the hair seal belongs to the great group of pinnipeds, yet it does not have even a generic affinity with those seals with which it has been so persistently grouped, namely, the fur seal and the sea lion. It no more resembles them than does the raccoon the black or grizzly bear.

I shall not enter into a detailed description of this seal; it is wholly superfluous, for excellent, and, I believe, trustworthy accounts have been repeatedly published by writers[1] who have treated of the subject as it was spread before their eyes on the coasts of Labrador, Newfoundland, and Greenland, to say nothing of the researches and notes made by European scientists. It differs completely in shape and habit from its congeners on these islands. Here, where I have studied its biology, it seldom comes up from the water more than a few rods at the farthest, generally hauling and resting at the margin of the surf wash. It takes up no position on land to hold and protect a family or harem, preferring the detached water-worn rocks, especially those on the lonely north shore of St. Paul, although I have seen it resting at Gorbotch, near the sea margin of the great seal rookery of that name, on the Reef Point of St. Paul, its cylindrical, supine gray and white body marked in strong contrast with the erect black and ocher-colored forms of the *Callorhinus* which swarmed around about it. On such small spots of rock, wet and isolated from the mainland, and in secluded places on the north shore, the "nearhpah" brings forth its young, a single pup, perfectly white, covered with long woolly hair, and weighing from 3 to 7 pounds. This pup grows rapidly, and after the lapse of four or five months it tips the scales at 50 pounds. By that time it has shed its infant coat and donned the adult soft steel-gray hair over the head, limbs, and abdomen, with the back most richly mottled and barred lengthwise by dark-brown and brown-black streaks and blotches, suffused at their edges into the light steel-gray ground of the body. When they appear in the spring following, this bright gray tone to their color has ripened into a dingy ocher and the mottling spread well over the head and down on the upper side or

[1] A very complete résumé has been given by Allen, Hist. North American Pinnipeds, 1880.

back of the flippers, but fades out as it progresses. It has no appreciable fur or underwool. There is no noteworthy difference as to color or size between the sexes. So far as I have observed they are not polygamous. They are exceedingly timid and wary at all times, and in this manner and method they are diametrically opposed, not by shape alone, but by habit and disposition, to the fashion of the fur seal in especial and the sea lion. Their skin is of little value comparatively, but their chief merit, according to the natives, is the relative greater juiciness and sweetness of their flesh over even the best steaks of sea lion or fur-seal pup meat.

One common point of agreement among all authors was, by my observations of fact, so strikingly refuted, that I will here correct a prevalent error made by naturalists who, comparing the hair seal with the fur seal, state that in consequence of the peculiar structure of their limbs their progression on land is "mainly accomplished by a wriggling, serpentine motion of the body, slightly assisted by the extremities." This is not so in any respect; for whenever I have purposely surprised these animals a few rods from the beach margin, they would awake and excitedly scramble, or rather spasmodically exert themselves to reach the water instantly, by striking out quickly with both forefeet simultaneously, lifting in this way alone, and dragging the whole body forward, without any "wriggling motion" whatever to their back or posterior parts, moving from 6 inches to a foot in advance every time their forefeet were projected forward and the body drawn along according to the violence of the effort and the character of the ground; the body of the seal then falls flat upon its stomach and the forefeet or flippers are free again for another similar motion. This action of *Phoca* is effected so continuously and so rapidly that in attempting to head off a young "nearhpah" from the water at English Bay, I was obliged to leave a brisk walk and take to a dogtrot to do it. The hind feet are not used when exerted in this rapid movement at all; they are dragged along in the wake of the body, perfectly limp and motionless. But they do use those posterior parts, however, when leisurely climbing up and over rocks undisturbed, or playing one with another; still it is always a weak, trembling terrestrial effort, and particularly impotent and clumsy. In their swift swimming the hind feet of *Phocidæ* evidently do all the work; the reverse is the characteristic of the *Otariidæ*.

These remarks of mine, it should be borne in mind, apply directly to *Phoca vitulina*, and I presume indirectly with equal force to all the rest of its more important generic kindred, be they as large as *Phoca barbata* or less.

This hair seal is found around these islands at all seasons of the year, but in very small numbers. I have never seen more than 25 or 30 at any one time, and I am told that its occidental distribution, although everywhere found, above and below, from the Arctic to the Tropics, and especially general over the North Pacific coast, nowhere exhibits any great number at any one place; but we know that it and its immediate kindred form a vast majority of the multitudinous seal life peculiar to our North Atlantic shores, ice floes, and contiguous waters. The scarcity of this species, and of all its generic allies, in the waters of the Pacific is notable as compared with those of the circumpolar Atlantic, where these hair seals are the seals of commerce, and are found in such immense numbers between Greenland and Labrador and thence to the eastward at certain seasons[1] of every year,

[1] March and April.

that employment is given to a fleet of about 60 sailing and steam vessels, which annually go forth[1] from St. John, Newfoundland, and elsewhere, fitted for seal fishing, taking in all their voyages over 300,000 of these animals each season; the principal object of value, however, is the oil rendered from them, the skins having very small commercial importance.[2] Touching oil, etc., a business digest of this subject, as it refers to the seal islands of Alaska, will be found in this memoir, in that portion descriptive of the methods employed by working the hauling grounds of the "holluschickie."

LIFE HISTORY OF THE FUR SEAL.

DESCRIPTION OF AN ADULT MALE.—The fur seal (*Callorhinus ursinus*) which repairs to these islands to breed and to shed its hair and fur, in numbers that seem almost fabulous, is the highest organized of all the *Pinnipedia*, and, indeed, for that matter, when land and water are weighed in the account together, there is no other animal known to man which can be truly, as it is, classed superior from a purely physical point of view. Certainly there are few, if any, creatures in the animal kingdom that can be said to exhibit a higher order of instinct, approaching even our intelligence.

I wish to draw attention to a specimen of the finest of this race—a male in the flush and prime of his first maturity, 6 or 7 years old, and full grown. When it comes up from the sea early in the spring, out to its station for the breeding season, we have an animal before us that will measure 6½ to 7¼ feet in length from tip of nose to the end of its abbreviated, abortive tail. It will weigh at least 400 pounds, and I have seen older specimens much more corpulent, which, in my best judgment, could not be less than 600 pounds in weight. The head of this animal now before us appears to be disproportionately small in comparison with the immensely thick neck and shoulders, but as we come to examine it we will find it is mostly all occupied by the brain. The light framework of the skull supports an expressive pair of large bluish-hazel eyes, alternately burning with revengeful, passionate light, then suddenly changing to the tones of

[1] Sailing on the 10th of March, simultaneously; the Canadian law prohibits earlier work in this respect.

[2] An excellent, and as far as I know a correct, description of this seal fishery in the North Atlantic has been published by Michael Carroll, in his Seal and Herring Fisheries of Newfoundland. This gentleman writes in a manner indicative of much familiarity with the business, though it is to be regretted that his observations were not more systematized and concentrated. Mr. Carroll, when he published his work in 1873, had enjoyed a personal experience of over fifty years in the hair-seal hunting of the North Atlantic, and this report is therefore perhaps the best exposition of the habit and condition of those *Phocidæ* that is extant; at least I should judge so. Robert Brown, in 1868 (Proc. Zool. Society, London, pp. 413–418), gives a graphic sketch of the life of the Greenland hair seal, while Ludwig Kumlein, in Bulletin No. 15 of the United States National Museum, 1879, presents altogether the most interesting and valuable biology of the hair seals in the waters of Cumberland Sound that has as yet been printed. Allen, in his History of the North American Pinnipeds, 1880, has, with painstaking labor, carefully compiled the pertinent remarks of a whole army of lesser authorities upon the doing and well-being of the *Phocidæ*, and has arranged them in his memoir so that they appear to the best advantage. Carroll's report is exceedingly interesting, and could he be induced to rewrite his notes, systematizing them, or permit some naturalist to do so who might draw out from him information on important points now hidden, the result undoubtedly would accrue greatly to the benefit of all concerned, and cause him to reap a fitting recognition of his knowledge of the subject, which seems to be very full and exhaustive, as far as expressed by himself.

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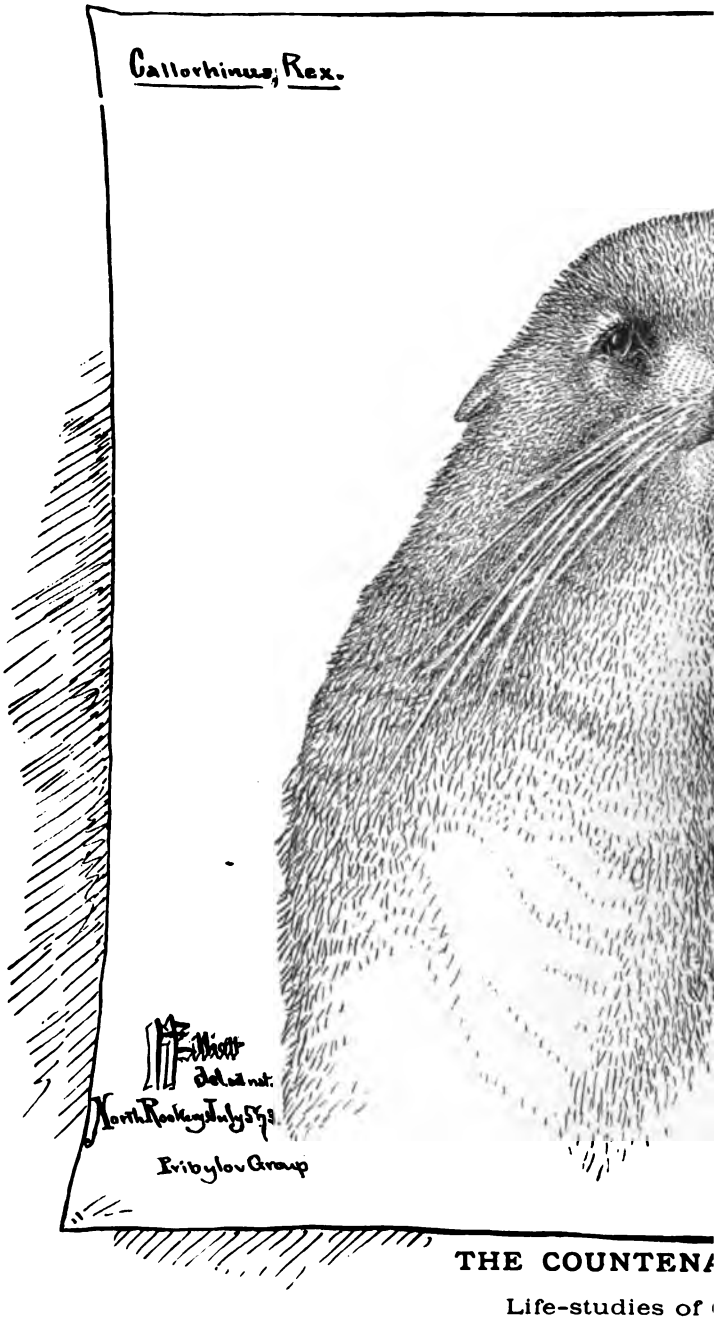
Plate V.



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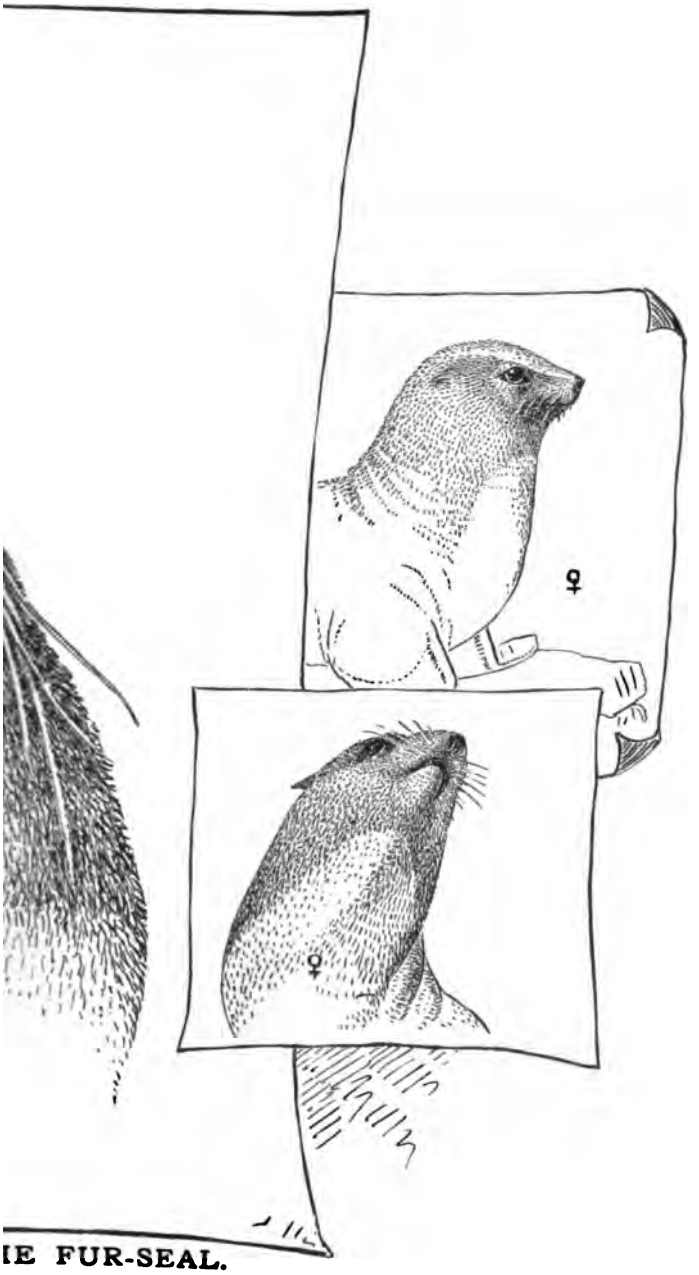

IE FUR-SEAL.

r the author.

iew of female.)

nderness and good nature. It has a muzzle and jaws of about the ıme size and form observed in any full-blooded Newfoundland dog, ith this difference, that the lips are not flabby and overhanging; ıey are as firmly lined and pressed against one another as our own. he upper lips support a yellowish white and gray mustache, composed of long, stiff bristles, and when it is not torn out and not broken f in combat, it sweeps down and over the shoulders as a luxuriant lume. Look at it as it comes leisurely swimming on toward the land; e how high above the water it carries its head and how deliberately surveys the beach, after having stepped upon it (for it may be truly ıid to step with its fore flippers, as they regularly alternate when it oves up), carrying the head well above them, erect and graceful, at ast 3 feet from the ground. The fore feet, or flippers, are a pair of ırk bluish-black hands, about 8 or 10 inches broad at their junction ith the body, and the metacarpal joint, running out to an ovate ›int at their extremity, some 15 to 18 inches from this union, all the st of the forearm, the ulna, radius, and humerus being concealed ıder the skin and thick blubber folds of the main body and neck, dden entirely at this season, when it is so fat. But six weeks to ree months after this time of landing, when that superfluous fat and sh has been consumed by self-absorption, those bones show plainly ıder the shrunken skin. On the upper side of these flippers the ir of the body straggles down finer and fainter as it comes below to point close by and slightly beyond that spot of junction where the ıalanges and the metacarpal bones unite, similar to that point on r own hand where our knuckles are placed; and here the hair ends, ıving the rest of the skin to the end of the flipper bare and wrined in places at the margin of the inner side; showing also fine ıall pits containing abortive nails, which are situated immediately er the union of the phalanges with their cartilaginous continuations the end of the flipper.

On the under side of the flipper the skin is entirely bare, from its ıter extremity up to the body connection; it is sensibly tougher and icker than elsewhere on the body; it is deeply and regularly rinkled with seams and furrows, which cross one another so as to ave a kind of sharp diamond-cut pattern. When they are placed by ıe animal upon the smoothest rocks, shining and slippery from goid growths and the sea-polish of restless waters, they seldom fail › adhere.

When we observe this seal moving out on the land, we notice that, ıough it handles its fore feet in a most creditable manner, it brings p its rear in quite a different style, for after every second step ahead ith the anterior limbs it will arch its spine, and in arching it drags nd lifts up, and together forward, the hind feet to a fit position under s body, giving it in this manner fresh leverage for another moveıent forward by the fore feet, in which the spine is again straightened ut, and then a fresh hitch is taken up on the posteriors once more, nd so on as the seal progresses. This is the leisurely and natural ıovement on land when not disturbed, the body all the time being arried clear of and never touching the ground. But if the creature › frightened, this method of progression is radically changed. It ıunches into a lope, and actually gallops so fast that the best powers f a man in running are taxed to head it off. Still, it must be remembered that it can not run far before it sinks trembling, gasping, beathess to the earth; 30 or 40 yards of such speed marks the utmost limit f its endurance.

The radical difference in the form and action of the hind feet can not fail to strike the eye at once; they are one-seventh longer than the fore hands, and very much lighter and more slender; they resemble, in broad terms, a pair of black kid gloves flattened out and shriveled as they lie in their box.

There is no suggestion of fingers on the fore hands; but the hind feet seem to be toes run into ribbons, for they literally flap about involuntarily from that point where the cartilaginous processes unite with the phalangeal bones. The hind feet are also merged in the body at their junction with it, like those anterior; nothing can be seen of the leg above the tarsal joint.

The shape of the hind flipper is strikingly like that of a human foot, provided the latter were drawn out to a length of 20 or 22 inches, the instep flattened down, and the toes run out into thin, membraneous, oval-tipped points, only skin thick, leaving 3 strong, cylindrical, grayish, horn-colored nails, half an inch long each, back 6 inches from these skinny toe ends, without any sign of nails to mention on the outer big and little toes.

On the upper side of this hind foot the body hair comes down to that point where the metatarsus and phalangeal bones join and fade out. From this junction the phalanges, about 6 inches down to the nails above mentioned, are entirely bare, and stand ribbed up in bold relief on the membrane which unites them, as the web to a duck's foot. The nails just referred to mark the ends of the phalangeal bones, and their union in turn with the cartilaginous processes, which run rapidly tapering and flattening out to the ends of the thin toe points. Now, as we are looking at this fur seal's motion and progression, that which seems most odd is the gingerly manner (if I may be allowed to use the expression) in which it carries these hind flippers. They are held out at right angles from the body directly opposite the pelvis, the toe ends or flaps slightly waving, curled, and drooping over, supported daintily, as it were, above the earth, the animal only suffering its weight behind to fall upon its heels, which are themselves opposed to each other, scarcely 5 inches apart.

We shall, as we see this seal again later in the season, have to notice a different mode of progression and bearing, both when it is lording over its harem, or when it grows shy and restless at the end of the breeding season, then faint, emaciated, and dejected; but we will now proceed to observe him in the order of his arrival and that of his family. His behavior during the long period of fasting and unceasing activity and vigilance, and other cares which devolve upon him as the most eminent of all polygamists in the brute world, I shall carefully relate; and to fully comprehend the method of this exceedingly interesting animal, it will be frequently necessary for the reader to refer to my sketch maps of its breeding grounds or rookeries, and the islands.

ARRIVAL AT THE SEAL-GROUNDS: COMING IN OF THE BULLS.—The adult males are the first examples of the *Callorhinus* to arrive in the spring on the seal ground, which has been deserted by all of them since the close of the preceding year.

Between the 1st and 5th of May, usually, a few males will be found scattered over the rookeries, pretty close to the water. They are, at this time, quite shy and sensitive, seeming not yet satisfied with the land; and a great many spend day after day idly swimming out among the breakers, a little distance from the shore, before they come to it, perhaps somewhat reluctant at first to enter upon the assiduous

duties and the grave responsibilities before them in fighting for and maintaining their positions in the rookeries.

The first arrivals are not always the oldest bulls, but may be said to be the finest and most ambitious of their class. They are full grown and able to hold their places on the rookeries or the breeding flats, which they immediately take up after coming ashore. Their method of landing is to come collectively to those breeding grounds where they passed the prior season; but I am not able to say authoritatively, nor do I believe it, strongly as it has been urged by many careful men who were with me on the islands, that these animals come back to and take up the same position on their breeding grounds that they individually occupied when there last year. From my knowledge of their action and habit, and from what I have learned of the natives, I should say that very few, if any, of them make such a selection and keep these places year after year. Even did the seal itself intend to come directly from the sea to that spot on the rookery which it left last summer, what could it do if it came to that rookery margin a little late, and found that another "see-catch" had occupied its ground? The bull could do nothing. It would either have to die in its tracks, if it persisted in attaining this supposed objective point, or do what undoubtedly it does do—seek the next best locality which it can attain adjacent.

One old "see-catch" was pointed out to me at the Gorbatch section of the Reef rookery as an animal that was long known to the natives as a regular visitor, close by or on the same rock, every season during the past three years. They called him "Old John," and they said they knew him because he had one of his posterior digits missing, bitten off, perhaps, in a combat. I saw him in 1872, and made careful drawings of him in order that I might recognize his individuality should he appear again in the following year, and when that time rolled by I found him not; he failed to reappear, and the natives acquiesced in his absence. Of course it was impossible to say that he was dead, when there were 10,000 rousing, fighting bulls to the right, left, and below us, under our eyes, for we could not approach for inspection. Still, if these animals came each to a certain place in any general fashion, or as a rule, I think there would be no difficulty in recognizing the fact; the natives certainly would do so; as it is, they do not. I think it very likely, however, that the older bulls come back to the same common rookery ground where they spent the previous season; but they are obliged to take up their position on it just as the circumstances attending their arrival will permit, such as finding other seals which have arrived before them, or of being whipped out by stronger rivals from their old stands.

It is entertaining to note, in this connection, that the Russians themselves, with the object of testing this mooted query, during the later years of their possession of the islands, drove up a number of young males from Lukannon, cut off their ears, and turned them out to sea again. The following season, when the droves came in from the hauling grounds to the slaughtering fields, quite a number of those cropped seals were in the drives, but instead of being found all at one place, the place from whence they were driven the year before, they were scattered examples of croppies from every point on the island. The same experiment was again made by our people in 1870 (the natives having told them of this prior undertaking), and they went also to Lukannon, drove up 100 young males, cut off their left ears, and set them free in turn. Of this number, during the summer

of 1872, when I was there, the natives found in their driving of 75,000 seals from the different hauling grounds of St. Paul up to the village killing grounds, two on Novastoshnah rookery, 10 miles north of Lukannon, and two or three from English Bay and Tolstoi rookeries, 6 miles west by water; one or two were taken on St. George Island, 36 miles to the southeast, and not one from Lukannon was found among those that were driven from there; probably, had all the young males on the two islands this season been examined, the rest of the croppies that had returned from the perils of the deep, whence they sojourned during the winter, would have been distributed quite equally about the Pribilof hauling grounds. Although the natives say that they think the cutting off of the animal's ear gives the water such access to its head as to cause its death, yet I noticed that those examples which we had recognized by this auricular mutilation were normally fat and well developed. Their theory does not appeal to my belief, and it certainly requires confirmation.

These experiments would tend to prove very cogently and conclusively that when the seals approach the islands in the spring they have nothing in their minds but a general instinctive appreciation of the fitness of the land, as a whole; and no special fondness or determination to select any one particular spot, not even the place of their birth. A study of my map of the distribution of the seal life on St. Paul clearly indicates that the landing of the seals on the respective rookeries is influenced greatly by the direction of the wind at the time of their approach to the islands in the spring and early summer. The prevailing airs, blowing, as they do at that season, from the north and northwest, carry far out to sea the odor of the old rookery flats, together with the fresh scent of the pioneer bulls which have located themselves on these breeding grounds, three or four weeks in advance of their kind. The seals come up from the great North Pacific, and hence it will be seen that the rookeries of the south and southeastern shores of St. Paul Island receive nearly all the seal life, although there are miles of perfectly eligible ground at Nahsayvernia, or north shore. To settle this matter beyond all argument, however, I know is an exceedingly difficult task, for the identification of individuals, from one season to another, among the hundreds of thousands, and even millions, that come under the eye on one of these great rookeries is well nigh impossible.

From the time of the first arrival in May up to the beginning of June, or as late as the middle of that month, if the weather be clear, is an interval in which everything seems quiet. Very few seals are added to the pioneers that have landed, as we have described. By the 1st of June, however, sometimes a little before and never much later, the seal weather—the foggy, humid, oozy damp of summer—sets in; and with it, as the gray banks roll up and shroud the islands, the bull seals swarm from the depths by hundreds and thousands, and locate themselves in advantageous positions for the reception of the females, which are generally three weeks or a month later than this date in arrival.

PREEMPTION OF THE ROOKERIES: BATTLES OF THE SEALS.—The labor of locating and maintaining a position on the rookery is really a terribly serious business for those bulls which come in last; and it is so all the time to those males that occupy the water line of the breeding grounds. A constantly sustained fight between the newcomers and the occupants goes on morning, noon, and night without cessation, frequently resulting in death to one, or even both, of the *combatants.*

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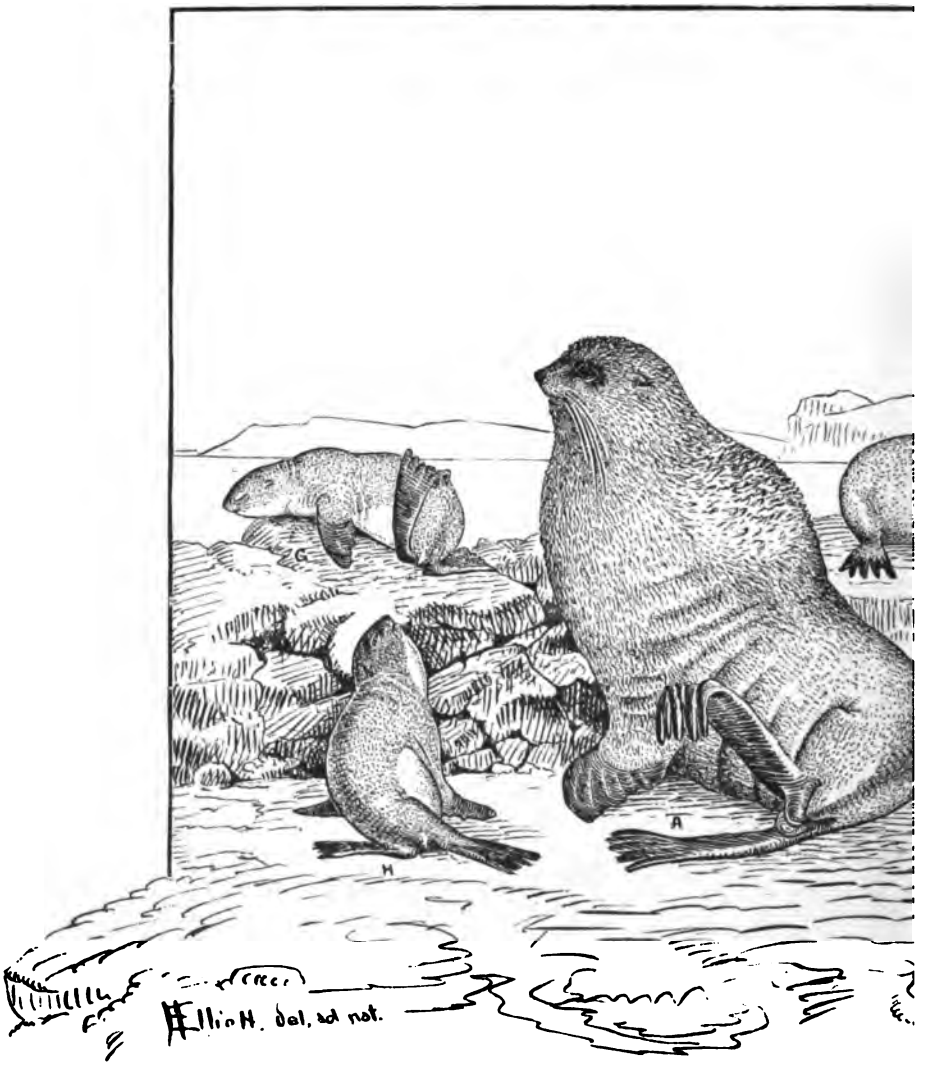
Plate VI.



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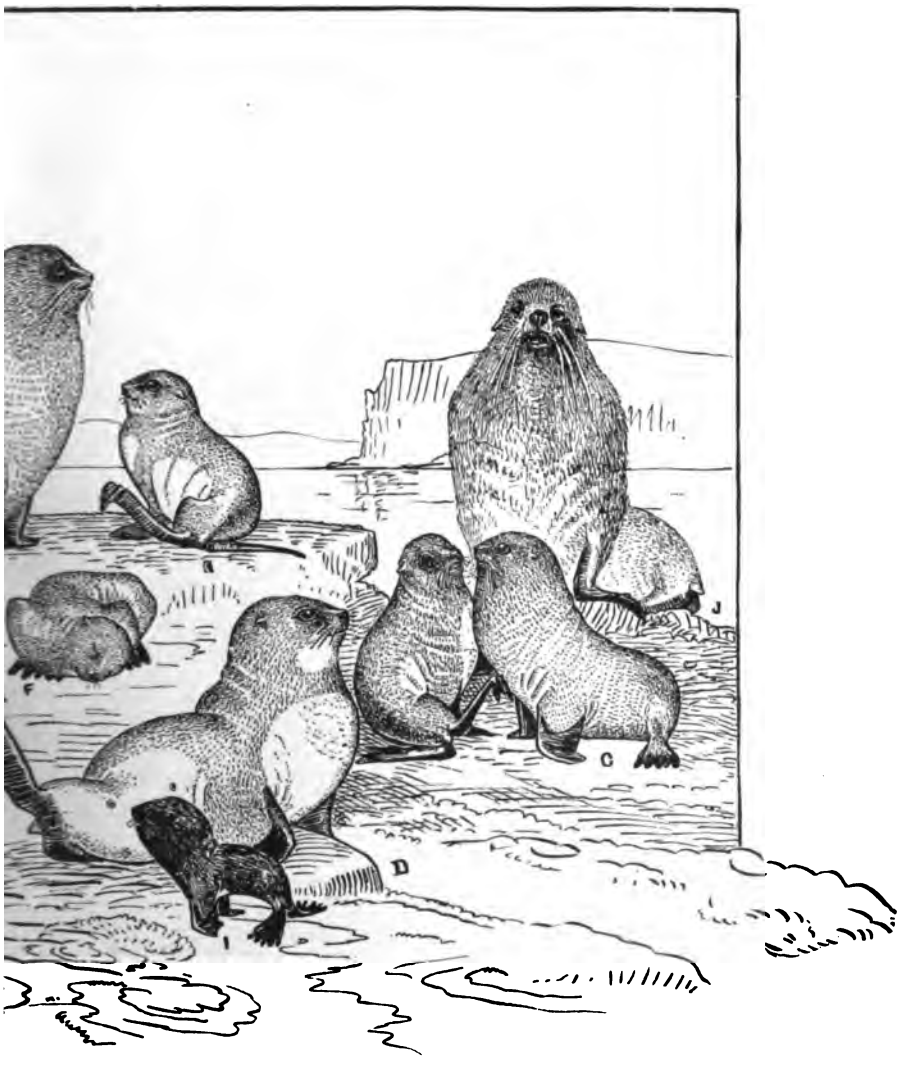
(Call

A. Old "Seecatch," or male, 8 to 24 years.
B. Young "Seecatch," 6 to 8 years.
C. "Holluschickie," or young males, 2 years.
D. "Matkah," or co
E. Cow fanning her
F. Cow sleeping.

Life-studies by t



EAL.

rsinus.)

up," I.

G. Cow napping and fanning herself.
H. Cow crooning to the male.
J. Characteristic twisting of bodies of old males.

ov Islands. 1872-'76.

It appears from my survey of these breeding grounds that a well-understood principle exists among the able-bodied bulls, to wit: That each one shall remain undisturbed on his ground, which is usually about 6 to 8 feet square, provided that at the start, and from that time until the arrival of the females, he is strong enough to hold his ground against all comers. Inasmuch as the crowding in of the fresh arrivals often causes the removal of those which, though equally able-bodied at first, have exhausted themselves by fighting earlier and constantly; they are finally driven by these fresher animals back farther and higher up on the rookery, and sometimes off altogether.

Many of those bulls exhibit wonderful strength and desperate courage. I marked one veteran at Gorbatch, who was the first to take up his position early in May, and that position, as usual, directly at the water line. This male seal had fought at least forty or fifty desperate battles and fought off his assailants every time, perhaps nearly as many different seals which coveted his position, and when the fighting season was over (after the cows are mostly all hauled up) I saw him still there, covered with scars and frightfully gashed—raw, festering, and bloody—and one eye gouged out, but lording it bravely over his harem of fifteen or twenty females, who were all huddled together on the same spot of his first location and around him.

This fighting between the old and adult males—for none others fight—is mostly, or rather entirely, done with the mouth. The opponents seize one another with their teeth, and then clenching their jaws nothing but the sheer strength of the one and the other tugging to escape can shake them loose, and that effort invariably leaves an ugly wound, the sharp canines tearing out deep gutters in the skin and furrows in the blubber or shredding the flippers into ribbon strips.

They usually approach each other with comically averted heads, just as though they were ashamed of the rumpus which they are determined to precipitate. When they get near enough to reach one another they enter upon the repetition of many feints or passes before either one or the other takes the initiative by gripping. The heads are darted out and back as quick as a flash; their hoarse roaring and shrill, piping whistle never ceases, while their fat bodies writhe and swell with exertion and rage; furious lights gleam in their eyes; their hair flies in the air and their blood streams down; all combined makes a picture so fierce and so strange that from its unexpected position and its novelty is perhaps one of the most extraordinary brutal contests man can witness.

In these battles of the seals the parties are always distinct—the one is offensive, the other defensive. If the latter proves the weaker, he withdraws from the position occupied, and is never followed by his conqueror, who complacently throws up one of his hind flippers, fans himself, as it were, to cool his fevered wrath and blood from the heat of the conflict, and sinks into comparative quiet, only uttering a peculiar chuckle of satisfaction or contempt, with a sharp eye open for the next covetous bull or "sea catch."[1]

ATTITUDES AND COLORATION OF THE FUR SEALS.—The period occupied by the males in taking and holding their positions on the rookery offers a very favorable opportunity to study them in the thousand and one different attitudes and postures assumed between the two extremes of desperate conflict and deep sleep—sleep so profound that one can, if he keeps to the leeward, approach close enough, stepping softly, to

[1] "Sea catch," native name for the bulls on the rookeries, especially those which are able to maintain their position.

pull the whiskers of any old male taking a nap on a clear place; but after the first touch to these moustaches the trifler must jump with electrical celerity back if he has any regard for the sharp teeth and tremendous shaking which will surely overtake him if he does not. The younger seals sleep far more soundly than the old ones, and it is a favorite pastime for the natives to surprise them in this manner—favorite because it is attended with no personal risk. The little beasts, those amphibious sleepers, rise suddenly and fairly shrink to the earth, spitting and coughing their terror and confusion.

The neck, chest, and shoulders of a fur-seal bull comprise more than two-thirds of his whole weight; and in this long, thick neck and the powerful muscles of the fore limbs and shoulders is embodied the larger portion of his strength. When on land, with the fore hands he does all climbing over the rocks and grassy hummocks back of the rookery, or shuffles his way over the smooth parades; the hind feet being gathered up as useless trappings after every second step forward, which we have described at the outset of this chapter. These anterior flippers are also the propelling power when in water, the exclusive machinery with which they drive their rapid passage; the hinder ones floating behind like the steering sweep to a whaleboat, used evidently as rudders, or as the tail of a bird is, while its wings sustain and force its rapid flight.

The covering to the body is composed of two coats, one being a short, crisp, glistening over-hair, and the other a close, soft, elastic pelage, or fur, which gives the distinctive value to the pelt. I can call it readily to the mind of my readers when I say to them that the down and feathers on the breast of a duck lay relatively as the fur and hair do upon the skin of the seal.

At this season of first "hauling up,"[1] in the spring, the prevailing color of the bulls, after they dry off and have been exposed to the weather, is a dark, dull brown, with a sprinkling in it of lighter brown-black, and a number of hoary or grizzly gray coats peculiar to the very old males. On the shoulders of all of them—that is, the adults—the over-hair is either a gray or rufous ocher or a very emphatic "pepper and salt;" this is called the "wig." The body colors are most intense and pronounced upon the back of the head, neck, and spine, fading down on the flanks lighter, to much lighter ground on the abdomen; still, never white or even a clean gray, so beautiful and peculiar to them when young, and to the females. The skin of the muzzle and flippers is a dark bluish-black, fading in the older examples to a reddish and purplish tint. The color of the ears and tail is similar to that of the body, perhaps a trifle lighter; the ears on the bull fur seal are from one inch to an inch and a half in length; the pavilions or auricles are tightly rolled up on themselves, so that they are similar in shape to and exactly the size of the little finger on the human hand cut off at the second phalangeal joint; a trifle more cone shaped, however, as they are greater at the base than they are at the tip. They are haired and furred as the body is.

I think it probable that this animal has and does exert the power of compressing or dilating this scroll-like pavilion to its ear, just according as it dives deeper or rises in the water; and also, I am quite sure that the hair seal has this control over the meatus externus, from what

[1] "Hauling up," a technical term, applied to the action of the seals when they land from the surf and haul up or drag themselves over the beach. It is expressive and appropriate, as are most of the sealing phrases.

I have seen of it. I have not been able to verify it in either case by actual observation; yet such opportunity as I have had gives me undoubted proof of the fact that the hearing of the fur seal is wonderfully keen and surpassingly acute. If you make any noise, no matter how slight, the alarm will be given instantly by these insignificant-looking auditors, and the animal, awaking from profound sleep, assumes with a single motion an erect posture, gives a stare of stupid astonishment, at the same time breaking out into incessant, surly roaring, growling, and "spitting."

VOICE OF THE FUR SEAL.—This spitting, as I call it, is by no means a fair or full expression of the most characteristic sound or action, so far as I have observed, peculiar to the fur seals alone, the bulls in particular. It is the usual prelude to all their combats, and it is their signal of astonishment. It follows somewhat in this way: When the two disputants are nearly within reaching or striking distance, they make a number of feints or false passes, as fencing masters do, at one another, with the mouth wide open, lifting the lips or snarling so as to exhibit the glistening teeth, and with each pass of the head and neck they expel the air so violently through the larynx as to make a rapid choo-choo-choo sound, like steam puffs as they escape from the smokestack of a locomotive when it starts a heavy train, especially while the driving wheels slip on the rail.

All of the bulls have the power and frequent inclination to utter four distinct calls or notes. This is not the case with the sea lion,[1] whose voice is confined to a single bass roar, or that of the walrus, which is limited to a dull grunt, or that of the hair seal,[2] which is inaudible. This volubility of the fur seal is decidedly characteristic and prominent; he utters a hoarse, resonant roar, loud and long; he gives vent to a low, entirely different, gurgling growl; he emits a chuckling, sibilant, piping whistle, of which it is impossible to convey an adequate idea, for it must be heard to be understood; and this spitting or choo sound just mentioned. The cows[3] have but one note—a hollow, prolonged bla-a-ting call, addressed only to their pups; on all other occasions they are usually silent. It is something strangely like the cry of a calf or an old sheep. They also make a spitting sound or snort when suddenly disturbed—a kind of cough, as it were. The pups "blaat" also, with little or no variation, their sound being somewhat weaker and hoarser than their mother's, after birth; they, too, comically spit or cough when aroused suddenly from a nap or driven into a corner, opening their little mouths like young birds in a nest, when at bay, backed up in some crevice or against some tussock.

Indeed, so similar is the sound that I noticed that a number of sheep

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[1] *Eumetopias Stelleri.*

[2] *Phoca vitulina.*

[3] Without explanation, I may be considered as making use of paradoxical language by using these terms of description; for the inconsistency of talking of "pups," with "cows," and "bulls," and "rookeries," on the breeding grounds of the same can not fail to be noticed; but this nomenclature has been given and used by the American and English whaling and sealing parties for many years, and the characteristic features of the seals themselves so suit the naming that I have felt satisfied to retain the style throughout as rendering my description more intelligible, especially so to those who are engaged in the business, or may be hereafter. The Russians are more consistent, but not so "pat." They call the bull "see-catch," a term implying strength, vigor, etc.; the cow, "matkah," or mother; the pups, "kotickie," or little seals; the nonbreeding males under six and seven years, "hollnschickie," or bachelors. The name applied collectively to the fur seal by them is "morskie-kot," or sea cat.

which the Alaska Commercial Company had brought up from San Francisco to St. George Island during the summer of 1873 were constantly attracted to the rookeries, and were running in among the "holluschickie;" so much so, that they neglected the good pasturage on the uplands beyond, and a small boy had to be regularly employed to herd them where they could feed to advantage. These transported *Ovidæ*, though they could not possibly find anything in their eyes suggestive of companionship among the seals, had their ears so charmed by the sheep-like accents of the female pinnipeds as to persuade them against their senses of vision and smell.

The sound which arises from these great breeding grounds of the fur seal, where thousands upon tens of thousands of angry, vigilant bulls are roaring, chuckling, and piping, and multitudes of seal mothers are calling in hollow, bleating tones to their young, that in turn respond incessantly, is simply defiance to verbal description. It is at a slight distance softened into a deep booming, as of a cataract; and I have heard it, with a light, fair wind to the leeward, as far as 6 miles out from land on the sea; and even in the thunder of the surf and the roar of heavy gales it will rise up and over to your ear for quite a considerable distance away. It is the monitor which the sea captains anxiously strain their ears for when they run their dead reckoning up and are laying to for the fog to rise, in order that they may get their bearings of the land. Once heard, they hold on to the sound and feel their way in to anchor. The seal roar at Novastoshnah during the summer of 1872 saved the life of the surgeon[1] and 6 natives belonging to the island, who had pushed out on an egging trip from Northeast Point to Walrus Island. I have sometimes thought, as I have listened through the night to this volume of extraordinary sound, which never ceases with the rising or the setting of the sun throughout the entire season of breeding, that it was fully equal to the churning boom of the waves of Niagara. Night and day, throughout the season, this din upon the rookeries is steady and constant.

EFFECTS OF HEAT ON THE SEALS.—The seals seem to suffer great inconvenience and positive misery from a comparatively low degree of heat. I have often been surprised to observe that, when the temperature was 46° and 48° F. on land during the summer, they would show everywhere signs of distress, whenever they made any exertion in moving or fighting, evidenced by panting and the elevation of their hind flippers, which they used incessantly as so many fans. With the thermometer again higher, as it is at rare intervals, standing at 55° and 60°, they then seem to suffer even when at rest, and at such times the eye is struck by the kaleidoscopic appearance of a rookery. In any of these rookeries where the seals are spread out in every imaginable position their lithesome bodies can assume, all industriously fan themselves. They use sometimes the fore flippers as ventilators, as it were, by holding them aloft motionless, at the same time fanning briskly with the hinder ones, according as they sit or lie. This wavy motion of fanning or flapping gives a hazy indistinctness to the whole scene which is difficult to express in language; but one of the most prominent characteristics of the fur seal, and perhaps the most unique

[1] Dr. Otto Cramer. The suddenness with which fog and wind shut down and sweep over the sea here, even when the day opens most auspiciously for a short boat voyage, has so alarmed the natives in times past that a visit is now never made by them from island to island unless on one of the company's vessels. Several bidarrahs have never been heard from, which, in earlier times, attempted to sail, with picked crews of the natives, from one island to the other.

feature, is this very fanning manner in which they use their flippers, when seen on the breeding grounds at this season. They also, when idle, as it were, off shore at sea, lie on their sides in the water with only a partial exposure of the body, the head submerged, and then hoist up a fore or hind flipper clear out of the water, at the same time scratching themselves or enjoying a momentary nap; but in this position there is no fanning. I say "scratching," because the seal, in common with all animals, is preyed upon by vermin, and it has a peculiar species of louse, or parasitic tick, that belongs to it.

SLEEPING AFLOAT.—Speaking of the seal as it rests in the water, leads me to remark that they seem to sleep as sound and as comfortably, bedded on the waves or rolled by the swell, as they do on the land. They lie on their backs, fold the fore flippers down across the chest, and turn the hind ones up and over, so that the tips rest on their necks and chins, thus exposing simply the nose and the heels of the hind flippers above water, nothing else being seen. In this position, unless it is very rough, the seal sleeps as serenely as did the prototype of that memorable song who was "rocked in the cradle of the deep."

FASTING OF THE SEALS AT THE ROOKERIES: INTESTINAL WORMS.—All the bulls, from the very first, that have been able to hold their positions, have not left them from the moment of their landing for a single instant, night or day; nor will they do so until the end of the rutting season, which subsides entirely between the 1st and 10th of August, beginning shortly after the coming of the cows in June. Of necessity, therefore, this causes them to fast, to abstain entirely from food of any kind, or water, for three months at least; and a few of them actually stay out four months, in total abstinence, before going back into the water for the first time after "hauling up" in May. They then return as so many bony shadows of what they were only a few months anteriorly. Covered with wounds, abject and spiritless, they laboriously crawl back to the sea to renew a fresh lease of life.

Such physical endurance is remarkable enough alone; but it is simply wonderful, when we come to associate this fasting with the unceasing activity, restlessness, and duty devolved upon the bulls as the heads of large families. They do not stagnate like hibernating bears in caves; there is not one torpid breath drawn by them in the whole period of their fast. It is evidently sustained and accomplished by the self-absorption of their own fat, with which they are so liberally supplied when they first come out from the sea and take up their positions on the breeding grounds; and which gradually disappears, until nothing but the staring hide, protruding tendons, and bones mark the limit of their abstinence. There must be some remarkable provision made by nature for the entire torpidity of the seals' stomachs and bowels, in consequence of their being empty and unsupplied during this long period, coupled with the intense activity and physical energy of the animals throughout that time, which, however, in spite of the violation of a supposed physiological law, does not seem to affect them, for they come back just as sleek, fat, and ambitious as ever, in the following season.

I have examined the stomachs of hundreds which were driven up and killed immediately after their arrival in the spring, near the village; I have the word of the natives here, who have seen hundreds of thousands of them opened during the slaughtering seasons past, but in no single case has anything ever been found, other than the bile and ordinary secretions of healthy organs of this class, with the

marked exception of finding in every one a snarl or cluster of worms,[1] from the size of a walnut to a bunch as large as a man's fist. Fasting apparently has no effect upon the worms, for on the rare occasion, and perhaps the last one that will ever occur, of killing three or four hundred old bulls late in the fall to supply the natives with canoe skins, I was present, and again examined their paunches, finding the same *ascaridæ* within. They were lively in these empty stomachs, and their presence, I think, gives some reason for the habit which the old bulls have (the others do not) of swallowing small water-worn bowlders, the stones in some of the stomachs weighing half a pound apiece, in others much smaller. In one paunch I found over 5 pounds, in the aggregate, of large pebbles, which, in grinding against one another, I believe, must comfort the seal by aiding to destroy, in a great measure, those intestinal pests.

The sea lion is also troubled in the same way by a similar species of worm, and I preserved the stomach of one of these animals in which there was more than 10 pounds of stones, some of them alone very great in size. Of this latter animal, I suppose it could swallow bowlders that weigh 2 and 3 pounds each. I can ascribe no other cause for this habit among those animals than that given, as they are the highest type of the carnivora, eating fish as a regular means of subsistence, varying the monotony of this diet with occasional juicy fronds of seaweed or kelp, and perhaps a crab or such once in a while, provided it is small and tender or soft-shelled. I know that the sailors say that the *Callorhinus* swallows these stones to "ballast" himself; in other words, to enable him to dive deeply and quickly; but I noticed that the females and the "holluschickie" dive quicker and swim better than the old fellows above specified, and they do so without any ballast. They also have less muscular power, only a tithe of that which the "see-catch" possesses. No, the ballast theory is not tenable. (See note, 39, J.)

ARRIVAL OF THE COW SEALS AT THE ROOKERIES.—Between the 12th and 14th of June the first of the cow seals, as a rule, come up from the sea; then the long agony of the waiting bulls is over, and they signalize it by a period of universal, spasmodic, desperate fighting among themselves. Though they have quarreled all the time from the moment they first landed, and continue to do so until the end of the season, in August, yet that fighting which takes place at this date is the bloodiest and most vindictive known to the seal. I presume that the heaviest percentage of mutilation and death among the old males from these brawls occur in this week of the earliest appearance of the females.

A strong contrast now between the males and females looms up, both in size and shape, which is heightened by the air of exceeding peace and dovelike amiability which the latter class exhibit, in contradistinction to the ferocity and saturnine behavior of the former.

DESCRIPTION OF THE COW SEAL.—The cows are from 4 to 4½ feet in length from head to tail, and much more shapely in their proportions than the bulls. There is no wrapping around their necks and shoulders of unsightly masses of blubber; their lithe, elastic forms, from the first to the last of the season, are never altered. This they are, however, enabled to keep, because in the provision of seal economy they sustain no protracted fasting period, for soon after the birth of their young they leave it on the ground and go to the sea for food,

[1] Nematoda.

returning perhaps to-morrow, perhaps later, even not for several days in fact, to again suckle and nourish it, having in the meantime sped far off to distant fishing banks and satiated a hunger which so active and highly organized an animal must experience when deprived of sustenance for any length of time.

As the females come up wet and dripping from the water, they are at first a dull, dirty-gray color, dark on the back and upper parts, but in a few hours the transformation in their appearance made by drying is wonderful. You would hardly believe that they could be the same animals, for they now fairly glisten with a rich steel and maltese gray luster on the back of the head, the neck, and along down the spine, which blends into an almost snow-white over the chest and on the abdomen. But this beautiful coloring in turn is again altered by exposure to the same weather, for after a few days it will gradually change, so that by the lapse of two or three weeks it is a dull, rufous ocher below, and a cinereous brown and gray mixed above. This color they retain throughout the breeding season, up to the time of shedding their coat in August.

The head and eye of the female are exceedingly beautiful. The expression is really attractive, gentle, and intelligent. The large, lustrous, blue-black eyes are humid and soft with the tenderest expression, while the small, well-formed head is poised as gracefully on her neck as can be well imagined. She is the very picture of benignity and satisfaction when she is perched up on some convenient rock and has an opportunity to quietly fan herself, the eyes half closed and the head thrown back on her gently-swelling shoulders.

The females land on these islands not from the slightest desire to see their uncouth lords and masters, but from an accurate and instinctive appreciation of the time in which their period of gestation ends. They are, in fact, driven up to the rookeries by this cause alone. The young can not be brought forth in the water, and in all cases marked by myself the pups were born soon after landing, some in a few hours, but most usually a day or so elapses before delivery.

ORGANIZATION OF THE ROOKERIES.—They are noticed and received by the males on the water-line stations with attention; they are alternately coaxed and urged up on to the rocks, as far as these beach masters can do so, by chuckling, whistling, and roaring, and then they are immediately under the most jealous supervision; but, owing to the covetous and ambitious nature of the bulls which occupy these stations to the rear of the water line and way back, the little cows have a rough-and-tumble time of it when they begin to arrive in small numbers at first; for no sooner is the pretty animal fairly established on the station of male number one, who has welcomed her there, then he, perhaps, sees another one of her style in the water from whence she has come, and, in obedience to his polygamous feeling, devotes himself anew to coaxing the later arrival, by that same winning manner so successful in the first case. Then when bull number two, just back, observes bull number one off guard, he reaches out with his long strong neck and picks up the unhappy but passive cow by the scruff of her's, just as a cat does a kitten, and deposits her upon his seraglio ground. Then bulls number three and four, and so on, in the vicinity, seeing this high-handed operation, all assail one another, especially number two, and for a moment have a tremendous fight, perhaps lasting half a minute or so, and during this commotion the little cow is generally moved, or moves, farther back from the water, two or three stations more, where, when all gets quiet again, she

usually remains in peace. Her last lord and master, not having the exposure to such diverting temptation as her first, gives her such care that she not only is unable to leave, did she wish, but no other bull can seize upon her. This is only a faint (and I fully appreciate it), wholly inadequate description of the hurly-burly and the method by which the rookeries are filled up, from first to last, when the females arrive. That is only one instance of the many trials and tribulations which both parties on the rookery subject themselves to before the harems are filled.

Far back, 15 or 20 "see-catchie" stations deep from the water line, and sometimes more, but generally not over an average of 10 or 15, the cows crowd in at the close of the season for arriving, which is by the 10th or 14th of July. Then they are able to go about pretty much as they please, for the bulls have become so greatly enfeebled by this constant fasting, fighting, and excitement during the past two months that they are quite content now even with only one or two partners, if they should have no more.

The cows seem to haul up in compact bodies from the water, filling in the whole ground to the rear of the rookeries, never scattering about over the surface of this area; they have mapped out from the first their chosen resting places, and they will not lie quietly in any position outside of the great mass of their kind. This is due to their intensely gregarious nature, and admirably adapted for their protection. And here I should call attention to the fact that they select this rookery ground with all the skill of civil engineers. It is preferred with special reference to the drainage, for it must lie so that the produce of the constantly dissolving fogs and rain clouds shall not lie upon them, having a great aversion to and a firm determination to rest nowhere on water-puddled ground. This is admirably exhibited and will be understood by a study of my sketch-maps which follow, illustrative of these rookeries and the area and position of the seals upon them. Every one of those breeding grounds slopes up gently from the sea, and on no one of them is there anything like a muddy flat.

I found it an exceedingly difficult matter to satisfy myself as to a fair general average number of cows to each bull on the rookery; but after protracted study I think it will be nearly correct when I assign to each male a general ratio of from 15 to 20 females at the stations nearest the water; and for those back in order from that line to the rear from 5 to 12; but there are so many exceptional cases, so many instances where 45 and 50 females are all under the charge of one male; and then, again, where there are 2 or 3 females only, that this question was and is not entirely satisfactory in its settlement to my mind.

Near Ketavie Point, and just above it to the north, is an odd washout of the basalt by the surf, which has chiseled, as it were, from the foundation of the island, a lava table with a single roadway or land passage to it. Upon the summit of this footstool I counted 45 cows, all under the charge of one old veteran. He had them penned up on this table rock by taking his stand at the gate, as it were, through which they passed up and passed down—a Turkish brute typified.

UNATTACHED MALES.—At the rear of all these rookeries there is invariably a large number of able-bodied males which have come late, but wait patiently, yet in vain, for families, most of them having had to fight as desperately for the privilege of being there as any of their more fortunately located neighbors, who are nearer the water and in

succession from there to where they are themselves; but the cows do not like to be in any outside position. They can not be coaxed out where they are not in close company with their female mates and masses. They lie most quietly and contentedly in the largest harems, and cover the surface of the ground so thickly that there is hardly moving or turning room until the females cease to come from the sea. The inaction on the part of the males in the rear during the breeding season only serves to qualify them to move into the places which are necessarily vacated by those males that are, in the meantime, obliged to leave from virile exhaustion or incipient wounds. All the surplus able-bodied males that have not been successful in effecting a landing on the rookeries can not at any one time during the season be seen here on this rear line. Only a portion of their number are in sight; the others are either loafing at sea, adjacent, or are hauled out in morose squads between the rookeries on the beaches.

COURAGE OF THE FUR SEAL.—The courage with which the fur seal holds his position as the head and guardian of a family is of the highest order. I have repeatedly tried to drive them from their harem posts, when they were fairly established on their stations, and have always failed, with few exceptions. I might use every stone at my command, making all the noise I could. Finally, to put their courage to the fullest test, I have walked up to within 20 feet of an old veteran, toward the extreme end of Tolstoi, who had only 4 cows in charge, and commenced with my double-barreled fowling-piece to pepper him all over with fine mustard-seed shot, being kind enough, in spite of my zeal, not to put out his eyes. His bearing, in spite of the noise, smell of powder, and painful irritation which the fine shot must have produced, did not change in the least from the usual attitude of determined, plucky defense, which nearly all of the bulls assumed when attacked with showers of stones and noise; he would dart out right and left with his long neck and catch the timid cows, that furtively attempted to run after each report of my gun, fling and drag them back to their places under his head; and then, stretching up to his full height, look me directly and defiantly in the face, roaring and chuckling most vehemently. The cows, however, soon got away from him; they could not stand my racket in spite of their dread of him; but he still stood his ground, making little charges on me of 10 or 15 feet, in a succession of gallops or lunges, spitting furiously, and then comically retreating to the old position, with an indescribable leer and swagger, back of which he would not go, fully resolved to hold his own or die in the attempt.

This courage is all the more noteworthy from the fact that in regard to man it is invariably of a defensive character. The seal is always on the defensive; he never retreats, and he will not attack. If he makes you return when you attack him, he never follows you much farther than the boundary of his station, and then no aggravation will compel him to take the offensive, so far as I have been able to observe. I was very much impressed by this trait.

BEHAVIOR OF THE FEMALE SEALS ON THE ROOKERIES.—The cows during the whole season do great credit to their amiable expression by their manner and behavior on the rookery. They never fight or quarrel one with the other, and never or seldom utter a cry of pain or rage when they are roughly handled by the bulls, which frequently get a cow between them and actually tear the skin from her back with their teeth, cutting deep gashes in it as they snatch her from mouth to mouth. If sand does not get into these wounds it is surpris-

ing how rapidly they heal; and, from the fact that I never could see scars on them anywhere except the fresh ones of this year, they must heal effectually and exhibit no trace the next season.

The cows, like the bulls, vary much in weight, but the extraordinary disparity in the size of the sexes, adult, is exceedingly striking. Two females, taken from the rookery nearest to St. Paul village, right under the bluffs and almost beneath the eaves of the natives' houses, called "Nah Speel," after they had brought forth their young, were weighed by myself, and their respective returns on the scales were 56 and 100 pounds each; the former being about 3 or 4 years old and the latter over 6—perhaps 10. Both were fat, or rather in good condition—as good as they ever are. Thus the female is just about one-sixth the size of the male.[1] Among the sea lions the proportion is just one-half the bulk of the male,[2] while the hair seals, as I have before stated, are not distinguishable in this respect, as far as I could observe, but my notice was limited to a few specimens only.

ATTITUDES OF FUR SEALS ON LAND.—It is quite beyond my power, indeed entirely out of the question, to give a fair idea of the thousand and one positions in which the seals compose themselves and rest when on land. They may be said to assume every possible attitude which a flexible body can be put into, no matter how characteristic or seemingly forced or constrained. Their joints seem to be double hinged; in fact, all ball-and-socket union of the bones. One favorite position, especially with the females, is to perch upon a point or edge top of some rock and throw their heads back upon their shoulders, with the nose held directly up and aloft, and then, closing their eyes, to take short naps without changing their attitude, now and then softly lifting one or the other of their long, slender hind flippers, which they slowly wave with that peculiar fanning motion to which I have alluded heretofore. Another attitude, and one of the most common, is to curl themselves up just as a dog does on a hearth rug, bringing the tail and nose close together. They also stretch out, laying the head close to the body, and sleep an hour or two without rising, holding one of the hind flippers up all the time, now and then gently moving it, the eyes being tightly closed.

I ought, perhaps, to define the anomalous tail of the fur seal here. It is just about as important as the caudal appendage to a bear, even less significant. It is the very emphasis of abbreviation. In the old males it is positively only 4 or 5 inches in length, while among the females only 2½ to 3 inches, wholly inconspicuous, and not even recognized by the casual observer.

SLEEPING SEALS.—I come now to speak of another feature which interested me nearly if not quite as much as any other characteristic of this creature, and that is their fashion of slumber. The sleep of the fur seal, seen on land, from the old male down to the youngest, is always accompanied by an involuntary, nervous, muscular twitching and slight shifting of the flippers, together with ever and anon quivering and uneasy rollings of the body, accompanied by a quick folding anew of the fore flippers, all of which may be signs, as it were, in fact, of their simply having nightmares, or of sporting, in a visionary way, far off in some dreamland sea; but perhaps very much as an old nurse said, in reference to the smiles on a sleeping child's face, they are disturbed by their intestinal parasites. I have studied hundreds of such

[1] Adult male and female.
[2] Adult male and female; *Eumetopias stelleri*.

somnolent examples. Stealing softly up so closely that I could lay my hand upon them from the point where I was sitting, did I wish to, and watching the sleeping seals, I have always found their sleep to be of this nervous description. The respiration is short and rapid, but with no breathing (unless the ear is brought very close) or snoring sound. The quivering heaving of the flanks only indicates the action of the lungs. I have frequently thought that I had succeeded in finding a snoring seal, especially among the pups, but a close examination always gave some abnormal reason for it, generally a slight distemper, never anything severer, however, than some trifle, by which the nostrils were stopped up to a greater or less degree.

The cows on the rookeries sleep a great deal, but the males have the veriest cat naps that can be imagined. I never could time the slumber of any old male on the breeding grounds which lasted without interruption longer than five minutes, day or night, while away from these places, however, I have known them to lie sleeping in the manner I have described, broken by these fitful, nervous, dreamy starts, yet without opening the eyes, for an hour or so at a time.

With the exception of the pups, the fur seal seems to have very little rest, awake or sleeping. Perpetual motion is well nigh incarnate with its being.

FUR-SEAL PUPS.—As I have said before, the females, soon after landing, are delivered of their young. Immediately after the birth of the pup (twins are rare, if ever) the little creature finds its voice, a weak, husky blaat, and begins to paddle about, with its eyes wide open from the start, in a confused sort of way for a few minutes, until the mother turns round to notice her offspring and give it attention, and still later to suckle it, and for this purpose she is supplied with four small brown nipples, almost wholly concealed in the fur, and which are placed about eight inches apart, lengthwise with the body, on the abdomen, between the fore and hind flippers, with about 4 inches of space between them transversely. These nipples are seldom visible, and then faintly seen through the hair and fur. The milk is abundant, rich, and creamy. The pups nurse very heartily, almost gorging themselves, so much so that they often have to yield up the excess of what they have taken down, mewling and puking in the most orthodox manner.

The pup from birth, and for the next three months, is of a jet-black color, hair and flippers, save a tiny white patch just back of each forearm. It weighs first from 3 to 4 pounds, and is 12 to 14 inches long. It does not seem to nurse more than once every two or three days, but in this I am very likely mistaken, for they may have received attention from the mother in the night, or other times in the day when I was unable to keep up my watch over the individuals which I had marked for this supervision.

The apathy with which the young are treated by the old on the breeding grounds, especially by the mothers, was very strange to me, and I was considerably surprised at it. I have never seen a seal mother caress or fondle her offspring; and should it stray to a short distance from the harem I could step to and pick it up, and even kill it before the mother's eye, without causing her the slightest concern, as far as all outward signs and manifestation would indicate. The same indifference is also exhibited by the male to all that may take place of this character outside of the boundary of his seraglio, but the moment the pups are inside the limits of his harem ground he is a jealous and a fearless protector, vigilant and determined; but if the

little animals are careless enough to pass beyond this boundary, then I can go up to them and carry them off before the eye of the old Turk without receiving from him the slightest attention in their behalf—a curious guardian, forsooth.

It is surprising to me how few of these young pups get crushed to death while the ponderous males are floundering over them, engaged in fighting and quarreling among themselves. I have seen two bulls dash at each other with all the energy of furious rage, meeting right in the midst of a small "pod" of 40 or 50 pups, tramp over them with all their crushing weight, and bowling them out right and left in every direction by the impetus of their movements, without injuring a single one, as far as I could see. Still, when we come to consider the fact that, despite the great weight of the old males, their broad, flat flippers and yielding bodies may press down heavily on these little fellows without actually breaking bones or mashing them out of shape, it seems questionable whether more than 1 per cent of all the pups born each season on these great rookeries of the Pribilof Islands are destroyed in this manner on the breeding grounds.[1]

The vitality of the fur seal is simply astonishing. His physical organization passes beyond the fabled nine lives of the cat. As a slight illustration of its tenure of life, I will mention the fact that one morning the chief came to me with a pup in his arms, which had just been born, and was still womb moist, saying that the mother had been killed at Tolstoi by accident, and he supposed that I would like to have a "choochil."[2] I took it up into my laboratory, and finding that it could walk about and make a great noise, I attempted to feed it, with the idea of having a comfortable subject to my pencil, for life study, of the young in the varied attitudes of sleep and motion. It refused everything that I could summon to its attention as food; and, alternately sleeping and walking, in its clumsy fashion, about the floor, it actually lived nine days—spending the half of every day in floundering over the floor, accompanying all movement with a persistent, hoarse, bleating cry—and I do not believe it ever had a single drop of its mother's milk.

In the pup, the head is the only disproportionate feature at birth, when it is compared with the adult form; the neck being also relatively shorter and thicker. The eye is large, round and full, but almost a "navy blue" at times; it soon changes into the blue-black of adolescence.

The females appear to go to and come from the water to feed and bathe quite frequently after bearing their young, and the immediate subsequent coitus with the male, and usually return to the spot or its immediate neighborhood, where they leave their pups, crying out for them and recognizing the individual replies, though ten thousand around altogether should bleat at once. They quickly single out their own and nurse them. It would certainly be a very unfortunate matter if the mothers could not identify their young by sound, since their pups get together like a great swarm of bees and spread out upon the ground in what the sealers call "pods," or clustered groups, while they are young and not very large; but from the middle or end of September until they leave the islands for the dangers of the great

[1] The only damage which these little fellows have up here is being caught by an October gale down at the surf margin when they have not fairly learned to swim. Large numbers have been destroyed by sudden "nips" of this character.

[2] Specimen to stuff.

Pacific in the winter, along by the first of November, they gather in this manner, sleeping and frolicking by tens of thousands, bunched together at various places all over the islands contiguous to the breeding grounds and right on them. A mother comes up from the sea, whither she has been to wash, and perhaps to feed, for the last day or two, feeling her way along to about where she thinks her pup should be—at least where she left it last—but perhaps she misses it, and finds instead a swarm of pups in which it has been incorporated, owing to its great fondness for society. The mother, without first entering into the crowd of thousands, calls out just as a sheep does for a lamb, and out of all the din she—if not at first, at the end of a few trials—recognizes the voice of her offspring, and then advances, striking out right and left, toward the position from which it replies. But if the pup happens at this time to be asleep, it gives, of course, no response, even though it were close by. In the event of this silence the cow, after calling for a time without being answered, curls herself up and takes a nap, or lazily basks, to be usually more successful, or wholly so, when she calls again.

The pups themselves do not know their own mothers—a fact which I ascertained by careful observation—but they are so constituted that they incessantly cry out at short intervals during the whole time they are awake, and in this way the mother can pick out, from the monotonous bleating of thousands of pups, her own, and she will not permit any other to suckle it; but the "kotickie" themselves attempt to nose around every seal mother that comes in contact with them. (See note, 39, I.)

DISORGANIZATION OF THE ROOKERIES.—Between the end of July and the 5th or 8th of August of every year the rookeries are completely changed in appearance; the systematic and regular disposition of the families or harems over the whole extent of breeding ground has disappeared; all that clockwork order which has heretofore existed seems to be broken up. The breeding season over, those bulls which have held their positions since the 1st of May leave, most of them thin in flesh and weak, and of their number a very large proportion do not come out again on land during the season; but such as are seen at the end of October and November are in good flesh. They have a new coat of rich, dark, gray-brown hair and fur, with gray or grayish ocher "wigs" of longer hair over the shoulders, forming a fresh, strong contrast to the dull, rusty, brown and umber dress in which they appeared to us during the summer, and which they had begun to shed about the 1st of August, in common with the females and "holluschickie." After these males leave, at the close of their season's work and of the rutting for the year, those of them that happen to return to the land in any event do not come back until the end of September, and do not haul upon the rookery grounds again. As a rule they prefer to herd together, like the younger males, upon the sand beaches and rocky points close to the water.

The cows and pups, together with those bulls which we have noticed in waiting in the rear of the rookeries, and which have been in retirement throughout the whole of the breeding season, now take possession, in a very disorderly manner, of the rookeries. There come, also, a large number of young, three, four, and five year-old males, which have been prevented by the menacing threats of the older, stronger bulls from landing among the females during the rutting season.

Before the middle of August three-fourths, at least, of the cows at this date are off in the water, only coming ashore at irregular inter-

vals to nurse and look after their pups a short time. They presented to my eye, from the summits of the bluffs round about, a picture more suggestive of entire comfort and enjoyment than anything I have ever seen presented by animal life. Here, just out and beyond the breaking of the rollers, they idly lie on the rocks or sand beaches, ever and anon turning over and over, scratching their backs and sides with their fore and hind flippers. The seals on the breeding ground appear to get very lousy. (See note, 39, K.)

MANGY COWS AND PUPS.—The frequent winds and showers drive and spatter sand into their fur and eyes, often making the latter quite sore. This occurs when they are obliged to leave the rocky rookeries and follow their pups out over the sand ridges and flats, to which they always have a natural aversion. On the hauling grounds they pack the soil under foot so hard and tightly in many places that it holds water in the surface depressions just like so many rock basins. Out of and into these puddles the pups and the females flounder and patter incessantly, until evaporation slowly abates the nuisance. This is for the time only, inasmuch as the next day, perhaps, brings more rain, and the dirty pools are replenished.

The pups sometimes get so thoroughly plastered in these muddy, slimy puddles, that the hair falls off in patches, giving them, at first sight, the appearance of being troubled with scrofula or some other plague; from my investigations directed to this point, I became satisfied that they were not permanently injured, though evidently very much annoyed. With reference to this suggestion as to sickness or distemper among the seals, I gave the subject direct and continued attention, and in no one of the rookeries could I discover a single seal, no matter how old or young, which appeared to be suffering in the least from any physical disorder, other than that which they themselves had inflicted, one upon the other, by fighting. The third season, passing directly under my observation, failed to reward my search with any manifestation of disease among the seals which congregate in such mighty numbers on the rookeries of St. Paul and St. George. The remarkable freedom from all such complaints enjoyed by these animals is noteworthy; and the most trenchant and penetrating cross-questioning of the natives also failed to give me any history or evidence of an epidemic in the past.

HOSPITALS.—The observer will, however, notice every summer, gathered in melancholy squads of a dozen to one hundred or so, scattered along the coast where the healthy seals never go, those sick and disabled bulls which have, in the earlier part of the season, been either internally injured or dreadfully scarred by the teeth of their opponents in fighting. Sand is blown by the winds into the fresh wounds and causes an inflammation and a sloughing, which very often finishes the life of the victim. The sailors term these invalid gatherings "hospitals," a phrase which, like most of their homely expressions, is quite appropriate.

YOUNG SEALS LEARNING TO SWIM.—Early in August, usually by the 8th or 10th, I noticed one of the remarkable movements of the season. I refer to the pup's first essay in swimming. Is it not odd—paradoxical—that the young seal, from the moment of his birth until he is a month or six weeks old, is utterly unable to swim? If he is seized by the nape of the neck and pitched out into the water a rod from shore, his bullet-like head will drop instantly below the surface, and his attenuated posterior extremities flap impotently on it; suffocation is the question of only a few minutes, the stupid little creature not knowing how to raise his immersed head and gain the air again. After

they have attained the age I indicate, their instinct drives them down to the margin of the surf, where the alternate ebbing and flowing of its wash covers and uncovers the rocky or sandy beaches. They first smell and then touch the moist pools, and flounder in the upper wash of the surf, which leaves them suddenly as high and dry as it immersed them at first. After this beginning they make slow and clumsy progress in learning the knack of swimming. For a week or two, when overhead in depth, they continue to flounder about in the most awkward manner, thrashing the water as little dogs do, with their fore feet, making no attempt whatever to use the hinder ones. Look at that pup now, launched out for the first time beyond his depth; see how he struggles, his mouth wide open, and his eyes fairly popping. He turns instantly to the beach, ere he has fairly struck out from the point whence he launched in, and as the receding swell which at first carried him off his feet and out, now returning, leaves him high and dry, for a few minutes he seems so weary that he weakly crawls up, out beyond its swift-returning wash, and coils himself up immediately to take a recuperative nap. He sleeps a few minutes, perhaps half an hour, then awakes as bright as a dollar, apparently rested, and at his swimming lesson he goes again. By repeated and persistent attempts the young seal gradually becomes familiar with the water and acquainted with his own power over that element, which is to be his real home and his whole support. Once boldly swimming, the pup fairly revels in his new happiness. He and his brethren have now begun to haul and swarm along the whole length of St. Paul coast, from Northeast Point down and around to Zapadnie, lining the alternating sand beaches and rocky shingle with their plump, black forms. How they do delight in it! They play with a zest, and chatter like our own children in the kindergartens—swimming in endless evolutions, twisting, turning, or diving—and, when exhausted, drawing their plump, round bodies up again on the beach. Shaking themselves dry, as young dogs would do, they now either go to sleep on the spot or have a lazy terrestrial frolic among themselves.

How an erroneous impression ever got into the mind of any man in this matter of the pup's learning to swim I confess that I am wholly unable to imagine. I have not seen any "driving" of the young pups into the water by the old ones in order to teach them this process, as certain authors have positively affirmed.[1] There is not the slightest supervision by the old mother or father of the pup from the first moment of his birth in this respect until he leaves for the North Pacific, full fledged with amphibious power. At the close of the breeding season every year the pups are restlessly and constantly shifting back and forth over the rookery ground of their birth in large squads, sometimes numbering thousands upon thousands. In the course of this change of position they all sooner or later come in contact with the sea; they then blunder into the water for the first time in a most awkward, ungainly manner, and get out as quickly as they can; but so far from showing any fear or dislike of this, their most natural element, as soon as they rest from their exertion they are immediately ready for a new trial, and keep at it, provided the sea is not too stormy or rough. During all this period of self-tuition they seem thoroughly to enjoy the exercise, in spite of their repeated and inevitable discomfitures at the beginning.

PODDING OF THE PUPS.—The "podding" of these young pups in the rear of the great rookeries of St. Paul is one of the most striking

[1] Allen. History of North American Pinnipeds, p. 387.

and interesting phases of this remarkable exhibition of highly organized life. When they first bunch together they are all black, for they have not begun to shed the natal coat; they shine with an unctuous, greasy reflection, and grouped in small armies or great regiments on the sand-dune tracts at Northeast Point they present a most extraordinary and fascinating sight. Although the appearance of the "holluschickie" at English Bay fairly overwhelms the observer with the impression of its countless multitudes, yet I am free to declare that at no one point in this evolution of the seal life, during the reproductive season, have I been so deeply stricken by the sense of overwhelming enumeration as I have when, standing on the summit of Cross Hill, I looked down to the southward and westward over a reach of 6 miles of alternate grass and sand-dune stretches, mirrored upon which were hundreds of thousands of these little black pups, spread in sleep and sport within this restricted field of vision. They appeared as countless as the grains of the sand upon which they rested.

SECOND CHANGE OF COAT.—By the 15th of September all the pups born during the year have become familiar with the water; they have all learned to swim, and are now nearly all down by the water's edge, skirting in large masses the rocks and beaches previously, this year, unoccupied by seals of any class. Now they are about five or six times their original weight, or, in other words, they are 30 to 40 pounds avoirdupois, as plump and fat as butterballs, and they begin to take on their second coat, shedding their black pup hair completely. This second coat does not vary in color, at this age, between the sexes. They effect this transformation in dress very slowly, and can not, as a rule, be said to have ceased their molting until the middle or 20th of October.

This second coat, or sea-going jacket, of the pup, is a uniform, dense, light-gray overhair, with an underfur which is slightly grayish in some, but is in most cases a soft, light-brown hue. The overhair is fine, close, and elastic, from two-thirds of an inch to an inch in length, while the fur is not quite half an inch long. Thus the coarser hair shingles over and conceals the soft underwool completely, giving the color by which, after the second year, the sex of the animal is recognized. The pronounced difference between the sexes is not effected, however, by color alone until the third year of the animal. This overhair of the young pup's new jacket, on the back, neck, and head, is a dark chinchilla-gray, blending into a stone-white, just tinged with a grayish tint on the abdomen and chest. The upper lip, upon which the whiskers or mustaches take root, is covered with hair of a lighter gray than that of the body. This mustache consists of 15 or 20 longer or shorter bristles, from half an inch to 3 inches in length, some brownish, horn-colored, and others whitish-gray and translucent, on each side, and back and below the nostrils, leaving the muzzle quite prominent and hairless. The nasal openings and their surroundings are, as I have before said when speaking of this feature, similar to those of a dog.

EYES OF THE PUP SEALS.—The most attractive feature about the fur-seal pup, and that which holds this place as it grows on and older, is the eye. This organ is exceedingly clear, dark, and liquid, with which, for beauty and amiability, together with real intelligence of expression, those of no other animal that I have ever seen or have ever read of can be compared; indeed, there are few eyes in the orbits of men and women which suggest more pleasantly the ancient thought of their being "windows to the soul." The lids to the eye are fringed with long, perfect lashes, and the slightest irritation in the way of dust

or sand or other foreign substances seems to cause them exquisite annoyance, accompanied by immoderate weeping. This involuntary tearfulness so moved Steller that he ascribed it to the processes of the seal's mind, and declared that the seal mothers actually shed tears.

RANGE OF VISION.—I do not think that their range of vision on land, or out of the water, is very great. I have frequently experimented with adult fur seals, by allowing them to catch sight of my person, so as to distinguish it as of foreign character, three or four hundred paces off, taking the precaution of standing to the leeward of them when the wind was blowing strong and then walking unconcernedly up to them. I have invariably noticed that they would allow me to approach quite close before recognizing my strangeness; this occurring to them they at once made a lively noise, a medley of coughing, spitting, snorting, and blaating, and plunged in spasmodic lopes and shambled to get away from my immediate neighborhood. As to the pups, they all stupidly stare at the form of a human being until it is fairly on them, when they also repeat in miniature these vocal gymnastics and physical efforts of the older ones, to retreat or withdraw a few rods, sometimes only a few feet, from the spot upon which you have cornered them, after which they instantly resume their previous occupation, of either sleeping or playing, as though nothing had happened. (See note, 39, M.)

POWER OF SCENT: ODOR OF THE SEALS.—The greatest activity displayed by any one of the five senses of the seal is evidenced in its power of scent. This faculty is all that can be desired in the line of alertness. I never failed to awaken an adult seal from the soundest sleep, when from a half to a quarter of a mile distant, no matter how softly I proceeded, if I got to the windward, though they sometimes took alarm when I was a mile off.

They leave evidences of their being on these great reproductive fields, chiefly at the rookeries, in the hundreds of dead carcasses which mark the last of those animals that have been rendered infirm, sick, or were killed by fighting among themselves in the early part of the season, or of those which have crawled far away from the scene of battle to die from death wounds received in the bitter struggle for a harem. On the rookeries, wherever these lifeless bodies rest, the living, old and young, clamber and patter backward and forward over and on the putrid remains, and by this constant stirring up of decayed matter, give rise to an exceedingly disagreeable and far-reaching "funk." This has been, by all writers who have dwelt on the subject, referred to as the smell which these animals emit for another reason—erroneously called the "rutting odor." If these creatures have any odor peculiar to them when in this condition, I will frankly confess that I am unable to distinguish it from the fumes which are constantly being stirred up and rising out of those decaying carcasses of the older seals, as well as from the bodies of the few pups which have been killed accidentally by the heavy bulls fighting over them, charging back and forth against one another, so much of the time.

They have, however, a very characteristic and peculiar smell when they are driven and get heated; their breath exhalations possess a disagreeable, faint, sickly odor, and when I have walked within its influence at the rear of a seal drive, I could almost fancy, as it entered my nostrils, that I stood beneath an ailanthus tree in bloom; but this odor can by no means be confounded with what is universally ascribed to another cause. It is also noteworthy that if your finger is touched ever so lightly to a little fur-seal blubber it will smell very much like that which I have appreciated and described as peculiar to their breath,

which arises from them when they are driven, only it is a little stronger. Both the young and old fur seals have this same breath taint at all seasons of the year.

REVIEW OF STATEMENTS CONCERNING LIFE IN THE ROOKERIES.—To recapitulate and sum up the system and regular method of life and reproduction on these rookeries of St. Paul and St. George, as the seals seem to have arranged it, I shall say that—

First. The earliest bulls land in a negligent, indolent way, at the opening of the season, soon after the rocks at the water's edge are free from ice, frozen snow, etc. This is, as a rule, about the 1st to the 5th of every May. They land from the beginning to the end of the season in perfect confidence and without fear; they are very fat, and will weigh at an average 500 pounds each; some stay at the water's edge, some go to the tier back of them again, and so on until the whole rookery is mapped out by them, weeks in advance of the arrival of the first female.

Second. That by the 10th or 12th of June all the male stations on the rookeries have been mapped out and fought for and held in waiting by the "see-catchie." These males are, as a rule, bulls rarely ever under 6 years of age; most of them are over that age, being sometimes three and, occasionally, doubtless, four times as old.

Third. That the cows make their first appearance, as a class, on or after the 12th or 15th of June, in very small numbers; but rapidly after the 23d and 25th of this month, every year, they begin to flock up in such numbers as to fill the harems very perceptibly; and by the 8th or 10th of July they have all come, as a rule, a few stragglers excepted. The average weight of the females now will not be much more than 80 to 90 pounds each.

Fourth. That the breeding season is at its height from the 10th to the 15th of July every year, and that it subsides entirely at the end of this month and early in August; also, that its method and system are confined entirely to the land, never effected in the sea.

Fifth. That the females bear their first young when they are three years old, and that the period of gestation is nearly twelve months, lacking a few days only of that lapse of time.

Sixth. That the females bear a single pup each, and that this is born soon after landing. No exception to this rule has ever been witnessed or recorded.

Seventh. That the "see-catchie" which have held the harems from the beginning to the end of the season, leave for the water in a desultory and straggling manner at its close, greatly emaciated, and do not return, if they do at all, until six or seven weeks have elapsed, when the regular systematic distribution of the families over the rookeries is at an end for this season. A general medley of young males now are free, which come out of the water, and wander over all these rookeries, together with many old males, which have not been on seraglio duty, and great numbers of the females. An immense majority over all others present are pups, since only about 25 per cent of the mother seals are out of the water now at any one time.

Eighth. That the rookeries lose their compactness and definite boundaries of true breeding limit and expansion by the 25th to the 28th of July every year; then, after this date, the pups begin to haul back, and to the right and left, in small squads at first, but as the season goes on, by the 18th of August, they depart without reference to their mothers; and when thus scattered, the males, females, and young swarm over more than three and four times the area occupied by them when breeding and born on the rookeries. The system of family

arrangement and uniform compactness of the breeding classes breaks up at this date.

Ninth. That by the 8th or 10th of August the pups born nearest the water first begin to learn to swim; and that by the 15th or 20th of September they are all familiar, more or less, with the exercise.

Tenth. That by the middle of September the rookeries are entirely broken up. Confused, straggling bands of females are seen among bachelors, pups, and small squads of old males, crossing and recrossing the ground in an aimless, listless manner. The season now is over.

Eleventh. That many of the seals do not leave these grounds of St. Paul and St. George before the end of December, and some remain even as late as the 12th of January, but that by the end of October and the beginning of November every year all the fur seals of mature age—5 and 6 years and upward—have left the islands. The younger males go with the others. Many of the pups still range about the islands, but are not hauled to any great extent on the beaches or the flats. They seem to prefer the rocky shore margin, and to lie as high up as they can get on such bluffy rookeries as Tolstoi and the Reef. By the end of this month—November—they are, as a rule, all gone.

Such is the sum and the substance of my observations which relate to the breeding grounds alone on St. Paul and St. George. It is the result of summering and wintering on them, and these definite statements I make with that confidence which one always feels when he speaks of that which has entered into his mind by repeated observation and has been firmly grounded by careful deductions therefrom.

THE "HOLLUSCHICKIE" OR "BACHELOR" SEALS—A DESCRIPTION.

THE HAULING GROUNDS AND THEIR OCCUPANTS.—I now call the attention of the reader to another very remarkable feature in the economy of the seal life on these islands. The great herds of "holluschickie,"[1] numbering from one-third to one-half, perhaps, of the whole aggregate of nearly 5,000,000 seals known to the Pribilof group, are never allowed by the "see-catchie" under the pain of frightful mutilation or death, to put their flippers on or near the rookeries.

By reference to my map it will be observed that I have located a large extent of ground—markedly so on St. Paul—as that occupied by the seals' "hauling grounds;" this area, in fact, represents those portions of the island upon which the "holluschickie" roam in their heavy squadrons, wearing off and polishing the surface of the soil, stripping every foot, which is indicated on the chart as such, of its vegetation and mosses, leaving the margin as sharply defined on the bluffy uplands and sandy flats as it is on the map itself.

The reason that so much more land is covered by the "holluschickie" than by the breeding seals—ten times as much at least—is due to the fact that though not as numerous, perhaps, as the breeding seals, they are tied down to nothing, so to speak—are wholly irresponsible, and roam hither and thither as caprice and the weather may dictate. Thus they wear off and rub down a much larger area than the rookery seals occupy; wandering aimlessly, and going back, in some instances, notably at English Bay, from one-half to a whole mile inland, not traveling in desultory files along winding, straggling paths, but sweeping

[1] The Russian term "holluschickie" or "bachelors" is very appropriate, and is usually employed.

in solid platoons, they obliterate every spear of grass and rub down nearly every hummock in their way.

DEFINITION OF "HOLLUSCHICKIE."—All the male seals, from 6 years of age, are compelled to herd apart by themselves and away from the breeding grounds, in many cases far away, the large hauling grounds at Southwest Point being about 2 miles from the nearest rookery. This class of seals is termed "holluschickie" or the "bachelor" seals by the people, a most fitting and expressive appellation.

The seals of this great subdivision are those with which the natives on the Pribilof group are the most familiar; naturally and especially so since they are the only ones, with the exception of a few thousand pups and occasionally an old bull or two, taken late in the fall for food and skins, which are driven up to the killing grounds at the village for slaughter. The reasons for this exclusive attention to the "bachelors" are most cogent, and will be given hereafter when the "business" is discussed.

LOCATING THE HAULING GROUNDS: PATHS THROUGH THE ROOKERIES.—Since the "holluschickie" are not permitted by their own kind to land on the rookeries and stop there, they have the choice of two methods of locating, one of which allows them to rest in the rear of the rookeries, and the other on the free beaches. The most notable illustration of the former can be witnessed on Reef Point, where a pathway is left for their ingress and egress through a rookery—a path left by common consent, as it were, between the harems. On these trails of passage they come and go in steady files all day and all night during the season, unmolested by the jealous bulls which guard the seraglios on either side as they travel; all peace and comfort to the young seal if he minds his business and keeps straight on up or down, without stopping to nose about right or left; all woe and desolation to him, however, if he does not, for in that event he will be literally torn in bloody griping from limb to limb by the vigilant old "see-catchie."

Since the two and three year old "holluschickie" come up in small squads with the first bulls in the spring, or a few days later, such common highways as those between the rookery ground and the sea are traveled over before the arrival of the cows and get well defined. A passage for the "bachelors," which I took much pleasure in observing day after day at Polavina, another at Tolstoi, and two on the Reef, in 1872, were entirely closed up by the "see-catchie" and obliterated when I again searched for them in 1874. Similar passages existed, however, on several of the large rookeries of St. Paul. One of those at Tolstoi exhibits this feature very finely, for here the hauling ground extends around from English Bay, and lies up back of the Tolstoi rookery over a flat and rolling summit from 100 to 120 feet above the sea level. The young males and yearlings of both sexes come through and between the harems at the height of the breeding season on two of these narrow pathways, and before reaching the ground above are obliged to climb up an almost abrupt bluff, which they do by following and struggling in the water runs and washes that are worn into its face. As this is a large hauling ground on which every favorable day during the season fifteen or twenty thousand commonly rest, the sight of skillful seal climbing can be witnessed here at any time during that period; and the sight of such climbing as this of Tolstoi is exceedingly novel and interesting. Why, verily, they ascend over and upon places where an ordinary man might at first sight with great positiveness say that it was utterly impossible for him to climb.

HAULING GROUNDS ON THE BEACHES.—The other method of coming

ashore, however, is the one most followed and favored. In this case they avoid the rookeries altogether, and repair to the unoccupied beaches between them, and then extend themselves out all the way back from the sea, as far from the water in some cases as a quarter and even half of a mile. I stood on the Tolstoi sand dunes one afternoon toward the middle of July and had under my eyes, in a straightforward sweep from my feet to Zapadnie, a million and a half of seals spread out on those hauling grounds. Of these I estimated that fully one-half at that time were pups, yearlings, and "holluschickie." The rookeries across the bay, though plainly in sight, were so crowded that they looked exactly as I have seen surfaces appear upon which bees had swarmed in obedience to that din and racket made by the watchful apiarian when he desires to hive the restless honey makers.

The great majority of yearlings and "holluschickie" are annually hauled out and packed thickly over the sand beach and upland hauling grounds which lie between the rookeries on St. Paul Island. At St. George there is nothing of this extensive display to be seen, for here is only a tithe of the seal life occupying St. Paul, and no opportunity whatever is afforded for an amphibious parade.

GENTLENESS OF THE SEALS.—Descend with me from this sand dune elevation of Tolstoi and walk into that drove of "holluschickie" below us. We can do it; you do not notice much confusion or dismay as we go in among them; they simply open out before us and close in behind our tracks, stirring, crowding to the right and left as we go, 12 or 20 feet away from us on each side. Look at this small flock of yearlings, some 1, others 2, and even 3 years old, which are coughing and spitting around us now, staring up at our faces in amazement as we walk ahead; they struggle a few rods out of our reach, and then come together again behind us, showing no further sign of notice of ourselves. You could not walk into a drove of hogs at Chicago without exciting as much confusion and arousing an infinitely more disagreeable tumult; and as for sheep on the plains, they would stampede far quicker. Wild animals, indeed! You can now readily understand how easy it is for two or three men early in the morning to come where we are, turn aside from this vast herd in front of and around us two or three thousand of the best examples, and drive them back, up, and over to the village. That is the way they get the seals; there is not any "hunting" or "chasing" or "capturing" of fur seals on these islands.

"HOLLUSCHICKIE" DO NOT FAST.—While the young male seals undoubtedly have the power of going for lengthy intervals without food, they, like the female seals on the breeding grounds, certainly do not maintain any long fasting periods on land; their coming and going from the shore is frequent and irregular, largely influenced by the exact condition of the weather from day to day; for instance, three or four thick, foggy days seem to call them out from the water by hundreds of thousands upon the different hauling grounds (which the reader observes recorded on my map). In some cases I have seen them lie there so close together that scarcely a foot of ground, over whole acres, is bare enough to be seen; then a clear and warmer day follows, and this seal-covered ground, before so thickly packed with animal life, will soon be almost deserted—comparatively so at least—to be filled up immediately as before when favorable weather shall again recur. They must frequently eat when here, because the first yearlings and "holluschickie" that appear in the spring are no fatter, sleeker, or livelier than they are at the close of the season; in other words, their condition, physically, seems to be the same from

the beginning to the end of their appearance here during the summer and fall. It is quite different, however, with the "see-catch;" we know how and where it spends two or three months, because we find it on the grounds at all times, day or night, during that period.

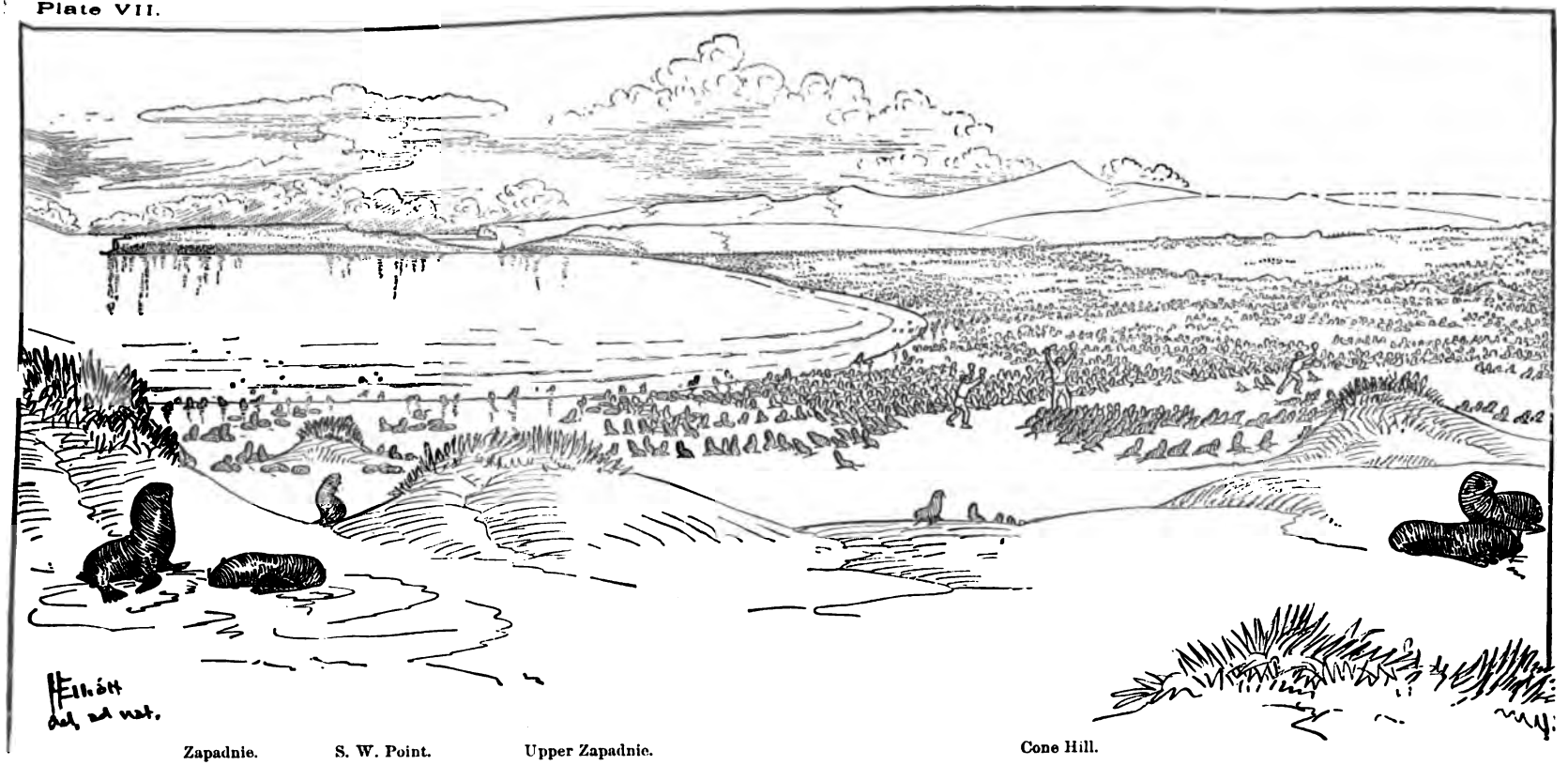
SPORTS AND PASTIMES OF THE YOUNG "BACHELORS."—A small flock of the young seals, 1 to 3 years old generally, will often stray from these hauling-ground margins, up and beyond, over the fresh mosses and grasses, and there sport and play one with another just as little puppy dogs do; and when weary of this gamboling a general disposition to sleep is suddenly manifested, and they stretch themselves out and curl up in all the positions and all the postures that their flexible spines and ball-and-socket joints will permit. They seem to revel in the unwonted vegetation, and to be delighted with their own efforts in rolling down and crushing the tall stalks of the grasses and umbelliferous plants; one will lie upon its back, hold up its hind flippers, and lazily wave them about, while it scratches, or rather rubs, its ribs with the fore hands alternately, the eyes being tightly closed during the whole performance; the sensation is evidently so luxurious that it does not wish to have any side issue draw off its blissful self-attention. Another, curled up like a cat on a rug, draws its breath, as indicated by the heaving of its flanks, quickly but regularly, as though in heavy sleep; another will lie flat upon its stomach, its hind flippers covered and concealed, while it tightly folds its fore feet back against its sides, just as a fish carries its pectoral fins—and so on to no end of variety, according to the ground and the fancy of the animals.

These "bachelor" seals are, I am sure, without exception, the most restless animals in the whole brute creation which can boast of a high organization. They frolic and lope about over the grounds for hours, without a moment's cessation, and their sleep, after this, is exceedingly short, and it is ever accompanied with nervous twitchings and uneasy muscular movements; they seem to be fairly brimful and overrunning with spontaneity—to be surcharged with fervid, electric life.

Another marked feature which I have observed among the multitudes of "holluschickie" which have come under my personal observation and auditory, and one very characteristic of this class, is that nothing like ill humor appears in all of their playing together. They never growl or bite, or show even the slightest angry feeling, but are invariably as happy, one with another, as can be imagined. This is a very singular trait. They lose it, however, with astonishing rapidity, when their ambition and strength develops and carries them, in due course of time, to the rookery. (See note, 39, N.)

The pups and yearlings have an especial fondness for sporting on the rocks which are just at the water's level and awash, so as to be covered and uncovered as the surf rolls in. On the bare summit of these wave-worn spots they will struggle and clamber in groups of a dozen or two at a time throughout the whole day in endeavoring to push off that one of their number which has just been fortunate enough to secure a landing. The successor has, however, but a brief moment of exultation in victory, for the next roller that comes booming in, together with the pressure by its friends, turns the table, and the game is repeated, with another seal on top. Sometimes, as well as I could see, the same squad of "holluschickie" played for a whole day and night, without a moment's cessation, around such a rock as this, off Nah Speel rookery; but in this observation I may be mistaken, because the seals can not be told apart.

SEALS AMONG THE BREAKERS.—The graceful unconcern with which



Zapadnie. S. W. Point. Upper Zapadnie. Cone Hill.

NATIVES SELECTING A DRIVE.

View over hauling-grounds of "holluschickie" at English Bay, looking west from Tolstoi Sand-dunes.

the fur seal sports safely in, among, and under booming breakers during the prevalence of the numerous heavy gales at the islands has afforded me many consecutive hours of spellbound attention to them, absorbed in watching their adroit evolutions within the foaming surf that seemingly every moment would, in its fierce convulsions, dash these hardy swimmers, stunned and lifeless, against the ironbound foundations of the shore, which alone checked the furious rush of the waves. Not at all. Through the wildest and most ungovernable mood of the roaring tempest and storm-tossed waters attending its transit I never failed, on creeping out and peering over the bluffs in such weather, to see squads of these perfect watermen—the most expert of all amphibians—gamboling in the seething, creamy wake of mighty rollers, which constantly broke in thunder tones over their alert, dodging heads. The swift-succeeding seas seemed every instant to poise the seals at the very verge of death; yet the *Callorhinus*, exulting in his skill and strength, bade defiance to their wrath and continued his diversions.

SWIMMING FEATS OF THE "BACHELORS."—The "holluschickie" are the champion swimmers of all the seal tribe; at least when in the water around the islands they do nearly every fancy tumble and turn that can be executed. The grave old males and their matronly companions seldom indulge in any extravagant display, as do these youngsters, jumping out of the water like so many dolphins describing beautiful elliptic curves sheer above its surface, rising 3 and even 4 feet from the sea, with the back slightly arched, the fore flippers folded tightly against the sides, and the hinder ones extended and pressed together straight out behind, plumping in head first, to reappear in the same manner, after an interval of a few seconds of submarine swimming, like the flight of a bird, on their course. Sea lions and hair seals never jump in this manner. (See note, 39, O.)

All classes will invariably make these dolphin jumps when they are surprised or are driven into the water, curiously turning their heads while sailing in the air, between the "rises" and "plumps," to take a look at the cause of their disturbance. They all swim rapidly, with the exception of the pups, and may be said to dart under the water with the velocity of a bird on the wing. As they swim they are invariably submerged, running along horizontally about 2 or 3 feet below the surface, guiding their course with the hind flippers as by an oar, and propelling themselves solely by the fore feet, rising to breathe at intervals which are either very frequent or else so wide apart that it is impossible to see the speeding animal when he rises a second time.

How long they can remain under water without taking a fresh breath is a problem which I had not the heart to solve by instituting a series of experiments at the island; but I am inclined to think that, if the truth were known in regard to their ability of going without rising to breathe, it would be considered astounding. On this point, however, I have no data worth discussing, but will say that, in all their swimming which I have had a chance to study, as they passed under the water, mirrored to my eyes from the bluff above by the whitish-colored rocks below the rookery waters at Great Eastern rookery, I have not been able to satisfy myself how they used their long, flexible hind feet other than as steering media. If these posterior members have any perceptible motion it is so rapid that my eye is not quick enough to catch it; but the fore flippers, however, can be most distinctly seen, as they work in feathering forward and sweeping flatly back, opposed to the water, with great rapidity and energy. They are evidently the

sole propulsive power of the fur seal in the water, as they are its main fulcrum and lever combined for progression on land. I regret that the shy nature of the hair seal never allowed me to study its swimming motions, but it seems to be a general point of agreement among authorities on the *Phocidæ*, that all motion in water by them arises from that power which they exert and apply with the hind feet. So far as my observations on the hair seal go, I am inclined to agree with this opinion.

All their movements in water, whether they are traveling to some objective point or are in sport, are quick and joyous; and nothing is more suggestive of intense satisfaction and pure physical comfort than is that spectacle which we can see every August a short distance out at sea from any rookery, where thousands of old males and females are idly rolling over on the billows side by side, rubbing and scratching with their fore and hind flippers, which are here and there stuck up out of the water by their owners, like the lateen sails of the Mediterranean feluccas, or, when the hind flippers are presented, like a cat o' nine tails. They sleep in the water a great deal, too, more than is generally supposed, showing that they do not come on land to rest—very clearly not.

CLASSING THE "HOLLUSCHICKIE" BY AGE.—When the "hollus-chickie" are up on land they can be readily separated into their several classes as to age by the color of their coats and size, when noted, namely, the yearlings, the two, three, four, and five year old males. When the yearlings, or the first class, haul out, they are dressed just as they were after they shed their pup coats and took on the second covering, during the previous year in September and October; and now, as they come out in the spring and summer, one year old, the males and females can not be distinguished apart, either by color or size, shape or action; the yearlings of both sexes have the same steel-gray backs and white stomachs, and are alike in behavior and weight.

Next year these yearling females, which are now trooping out with the youthful males on the hauling grounds, will repair to the rookeries, while their male companions will be obliged to come again to this same spot.

SHEDDING THE HAIR: STAGEY SEALS.—About the 15th and 20th of every August they have become perceptibly "stagey," or in other words, their hair is well under way in shedding. All classes, with the exception of the pups, go through this process at this time every year. The process requires about six weeks between the first dropping or falling out of the old overhair and its full substitution by the new. This takes place, as a rule, between August 1 and September 28.

The fur is shed, but it is so shed that the ability of the seal to take to the water and stay there, and not be physically chilled or disturbed during the process of molting, is never impaired. The whole surface of these extensive breeding grounds, traversed over by us after the seals had gone, was literally matted with the shed hair and fur. This under-fur or pelage is, however, so fine and delicate, and so much concealed and shaded by the coarser over-hair, that a careless eye or a superficial observer might be pardoned in failing to notice the fact of its dropping and renewal.

The yearling cows retain the colors of the old coat in the new, when they shed it for the first time, and from that time on, year after year, as they live and grow old. The young three-year-olds and the older cows look exactly alike, as far as color goes, when they haul up at first and dry out on the rookeries, every June and July.

The yearling males, however, make a radical change when they shed for the first time, for they come out from their "staginess" in a nearly uniform dark gray, and gray and black mixed, and lighter, with dark ocher to whitish on the upper and under parts, respectively. This coat, next year, when they appear as two-year-olds, shedding for the three-year-old coat, is a very much darker gray, and so on to the third, fourth, and fifth season; then after this, with age, they begin to grow more gray and brown, with rufous-ocher and whitish-tipped over-hair on the shoulders. Some of the very old bulls change in their declining years to a uniform shade all over of dull-grayish ocher. The full glory and beauty of the seal's mustache is denied to him until he has attained his seventh or eighth year.

COMPARATIVE SIZE OF FEMALES AND MALES.—The female does not get her full growth and weight until the end of her fourth year, so far as I have observed, but she does most of her growing longitudinally in the first two; after she has passed her fourth and fifth years, she weighs from 30 to 50 pounds more than she did in the days of her youthful maternity.

The male does not get his full growth and weight until the close of his seventh year, but realizes most of it, osteologically speaking, by the end of the fifth; and from this it may be perhaps truly inferred that the male seals live to an average age of 18 or 20 years, if undisturbed in a normal condition, and that the females attain ten or twelve seasons under the same favorable circumstances. Their respective weights, when fully mature and fat in the spring, will, in regard to the male, strike an average of from 400 to 500 pounds, while the females will show a mean of from 70 to 80 pounds.

I did not permit myself to fall into error in estimating this matter of weight, because I early found that the apparent huge bulk of a sea-lion bull or fur-seal male, when placed upon the scales, shrank far below my notions. I took a great deal of pains on several occasions during the killing season to have a platform scale carted out into the field, and as the seals were knocked down, and before they were bled, I had them carefully weighed, constructing the following table from my observations:

Table showing the weight, size, and growth of the fur seal (Callorhinus ursinus), from the pup to the adult, male and female.

Age.	Length.	Girth.	Gross weight of body.	Weight of skin.	Remarks.
	Inches.	*Inches.*	*Pounds.*	*Pounds.*	
One week	12 to 14	10 to 10¼	6 to 7¼	1¼	A male and female, being the only ones of the class handled, June 20, 1873.
Six months	24	25	39	3	A mean of 10 examples, males and females, alike in size, November 28, 1872.
One year	38	25	39	4½	A mean of 6 examples, males and females, alike in size, July 14, 1873.
Two years	45	30	58	5¼	A mean of 30 examples, all males, July 24, 1873.
Three years	52	36	87	7	A mean of 32 examples, all males, July 24, 1873.
Four years	58	42	135	12	A mean of 10 examples, all males, July 24, 1873.
Five years	65	52	200	16	A mean of 5 examples, all males, July 24, 1873.
Six years	72	64	280	25	A mean of 3 examples, all males, July 24, 1873.
Eight to twenty years	75 to 80	70 to 75	400 to 500	45 to 50	An estimate only, calculating on their weight when fat, and early in the season.

WEIGHT OF FEMALE SEALS.—The adult females will correspond with the three-year-old males in the above table, the younger cows weighing frequently only 75 pounds, and many of the older ones going as high as 120, but an average of 80 to 85 pounds is the rule. Those specimens of the females which I weighed were examples taken by me for transmission to the Smithsonian Institution; otherwise I should not have been permitted to make this record of their weight, inasmuch as weighing them means to kill them, and the law and the habit, or rather the prejudice of the entire community up there, is unanimously in opposition to any such proceeding, for they never touch females here, and never set their foot on or near the breeding grounds on such an errand. It will be noticed, also, that I have no statement of the weights of these exceedingly fat and heavy males which first appear on the breeding grounds in the spring. Those which I have referred to in the table above given were very much heavier at the time of their first appearance in May and June than at the moment when they were in my hands in July; but the cows and the other classes do not sustain protracted fasting, and therefore their weights may be considered substantially the same throughout the year.

CHANGE IN WEIGHT.—Thus, from the fact that all the young seals and females do not change much in weight from the time of their first coming out in the spring till that of their leaving in the fall and early winter, I feel safe in saying that they feed at irregular but not long intervals during the time that they are here under our observation, since they are constantly changing from land to water and from water to land day in and day out. I do not think that the young males fast longer than a week or ten days at a time, as a rule.

DISPERSAL OF THE "HOLLUSCHICKIE."—By the end of October and the 10th of November the great mass of the "holluschickie," the trooping myriads of English Bay, Southwest Point, Reef Parade, Lukannon Sands, the table-lands of Polavina, and the mighty hosts of Novastoshnah, at St. Paul, together with the quota of St. George, had taken their departure from its shores and had gone out to sea, spreading with the receding schools of fish that were now returning to the deep waters of the North Pacific, where, in that vast expanse, over which rolls an unbroken billow 5,000 miles from Japan to Oregon, they spend the winter and the early spring, until they reappear and break up, with their exuberant life, the dreary winter isolation of the land which gave them birth.

TASTE OF THE SEALS IN THE MATTER OF WEATHER.—A few stragglers remain, however, as late as the snow and ice will permit them to in and after December. They are all down by the water's edge then, and haul up entirely on the rocky beaches, deserting the sand altogether; but the first snow that falls makes them very uneasy, and I have seen a large hauling ground so disturbed by a rainy day and night that its hundreds of thousands of occupants fairly deserted it. The fur seal can not bear and will not endure the spattering of sand into its eyes, which always accompanies the driving of a rainstorm. They take to the water, to reappear when the nuisance shall be abated.

The weather in which the fur seal delights is cool, moist, foggy, and thick enough to keep the sun always obscured, so as to cast no shadows. Such weather, which is the normal weather of St. Paul and St. George, continued for a few weeks in June and July, brings up from the sea millions of fur seals. But, as I have before said, a little sunshine, which raises the temperature as high as 50° to 55° F., will send them back from the hauling grounds almost as quickly as they came. For-

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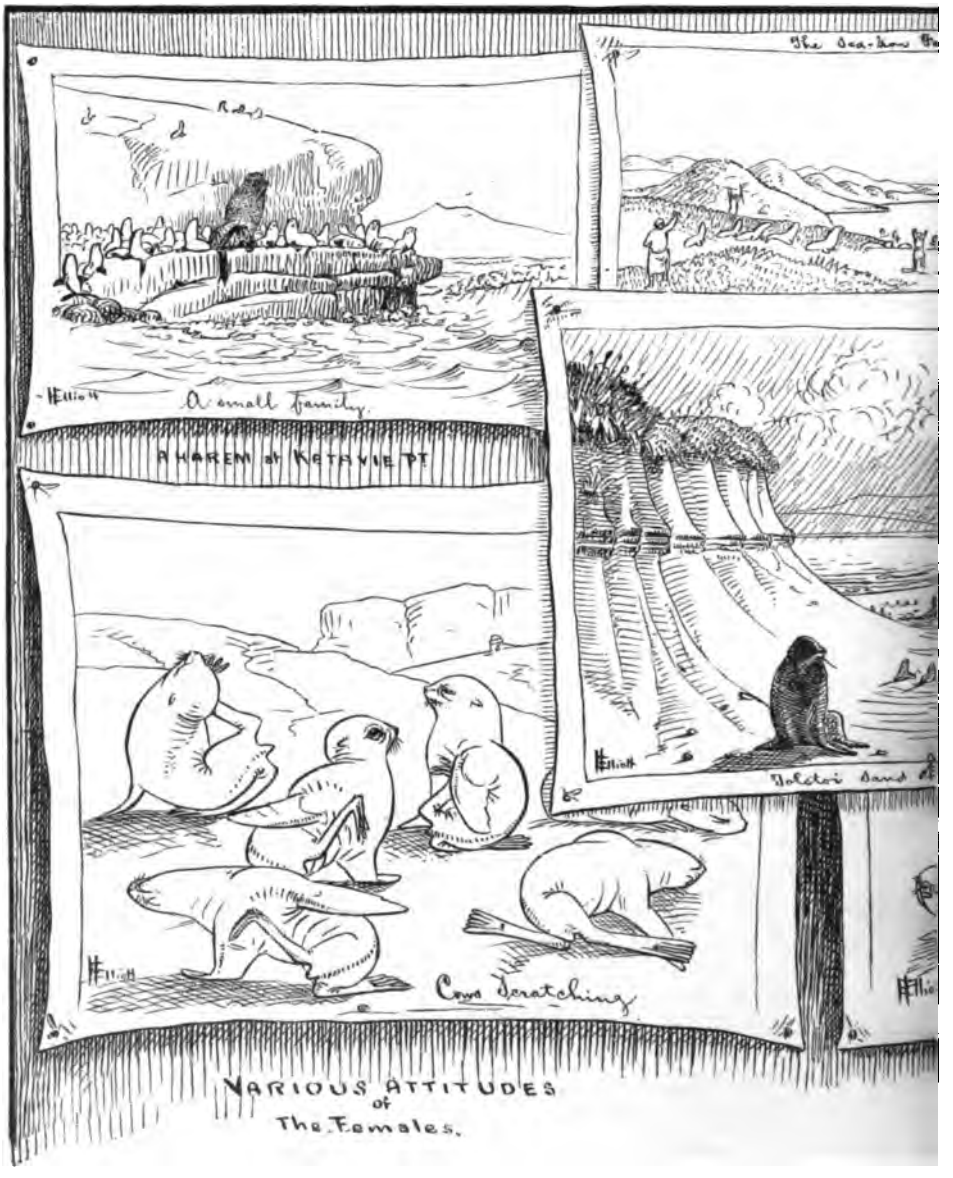
Plate VIII.



SUNDRY SEAL-SKETCHES FR

St. Paul Island, J

E AUTHOR'S PORTFOLIO.

July, 1872.

tunately, these warm, sunny days on the Pribilof Islands are so rare that the seals certainly can have no ground of complaint, even if we may presume they have any at all. Some curious facts in regard to their selection of certain localities on these islands and their abandonment of others I will discuss in a succeeding chapter, descriptive of the rookeries. This chapter is illustrated by topographical surveys made by myself.

ALBINOS.—I looked everywhere and constantly, when treading my way over acres of ground which were fairly covered with seal pups, and older ones, for specimens that presented some abnormity; that is, monstrosities, albinos, etc., such as I have seen in our great herds of stock; but I was, with one or two exceptions, unable to note anything of the kind. I have never seen any malformations or "monsters" among the pups and other classes of the fur seals, nor have the natives recorded anything of the kind, so far as I could ascertain from them. I saw only three albino pups among the multitudes on St. Paul, and none on St. George. They did not differ in any respect from the normal pups in size and shape. Their hair, for the first coat, was a dull ocher all over; the fur whitish, changing to a rich brown, the normal hue; the flippers and muzzle were a pinkish flesh tone in color, and the iris of the eye sky blue. When they shed the following year they are said to have a dirty, yellowish-white color, which makes them exceedingly conspicuous when mixed in among a vast majority of black pups, gray yearlings, and "holluschickie" of their kind. (See note, 39, O.)

WHERE DO THE SEALS DIE?—It is perfectly evident that a large percentage of this immense number of seals must die every year from natural limitation of life. They do not die on these islands; that much I am certain of. Not one dying a natural death could I find or hear of on the grounds. They evidently lose their lives at sea, preferring to sink with the rigor mortis into the cold, blue depths of the great Pacific, or beneath the green waves of Bering Sea, rather than to encumber and disfigure their summer haunts on the Pribilof Islands.

DESCRIPTION OF THE FUR-SEAL ROOKERIES OF ST. PAUL AND ST. GEORGE.

DEARTH OF INFORMATION CONCERNING THE FACTS ABOUT THE ROOKERIES.—Before I can intelligently and clearly present an accurate estimate of the aggregate number of fur seals which appear upon those great breeding grounds of the Pribilof group every season, I must take up, in regular sequence, my surveys of these remarkable rookeries which I have illustrated in this memoir by the accompanying sketch maps, showing topographically the superficial area and distribution assumed by the seal life at each locality.

It will be observed that the sum total on St. Paul Island preponderates and completely overshadows that which is represented at St. George. Before passing to the detailed discussion of each rookery, it is well to call attention to a few salient features in regard to the present appearance of the seals on these breeding grounds, which latter are of their own selection. Touching the location of the fur seals to-day, as I have recorded and surveyed it, compared with their distribution in early times, I am sorry to say that there is not a single line on a chart or a word printed in a book or a note made in manuscript which refers to this all-important subject prior to my own work,

which I present herewith for the first time to the public. The absence of definite information in regard to what I conceive to be of vital interest and importance to the whole business astonished me; I could not at first believe it; and, for the last four or five years, I have been searching among the archives of the old Russian company, as I searched diligently when up there and elsewhere in the Territory of Alaska, for some evidence in contradiction of this statement which I have just made. I wanted to find—I hoped to discover—some old record, some clue, by which I could measure with authority and entire satisfaction to my own mind the relative volume of seal life in the past as compared with that which I record in the present, but was disappointed.

I am unable, throughout the whole of the following discussion, to cite a single reliable statement which can give any idea as to the condition and numbers of the fur seal on these islands when they were discovered in 1786–87, or during the whole time of their occupation since up to the date of my arrival. I mark this so conspicuously, for it is certainly a very strange oversight, a kind of neglect, which, in my opinion, has been, to say the least, inexcusable.

RUSSIAN RECORDS.—In attempting to form an approximate conception of what the seals were or might have been in those early days, as they spread themselves over the hauling and breeding grounds of these remarkable islands, I have been thrown entirely upon the vague statements given to me by the natives and one or two of the first American pioneers in Alaska. The only Russian record which touches ever so lightly upon the subject[1] contains the remarkable statement, which is, in the light of my surveys, simply ridiculous now; that is, that the number of fur seals on St. George during the first years of Russian occupation was nearly as great as that on St. Paul. The most superficial examination of the geological character portrayed on the accompanying maps of these two islands will satisfy any unprejudiced mind as to the total error of such a statement. Why, a mere tithe only of the multitudes which repair to St. Paul, in perfect comfort, over the 16 to 20 miles of splendid landing ground found thereon, could visit St. George, when all of the coast line fit for their recep-

[1] Veniaminov: Zapieskie ob Oonalashkenskaho Otdayla, 2 vols., St. Petersburg, 1842. This work of Bishop Innocent Veniaminov is the only one which the Russians can lay claim to as exhibiting anything like a history of western Alaska, or of giving a sketch of its inhabitants and resources, that has the least merit of truth or the faintest stamp of reliability. Without it we should be simply in the dark as to much of what the Russians were about during the whole period of their occupation and possession of that country. He served, chiefly as a priest and missionary, for twenty-five years, from 1814 to 1839, at Unalaska, having the seal islands in his parish, and was made bishop of all Alaska. He was soon after recalled to Russia, where he has since become the primate of the national church, ranking second to no man in the Empire, save the Czar. He is advanced in years, being now more than 90 years of age. He must have been a man of fine personal appearance, judging from the following description of him, noted by Sir George Simpson, who met him at Sitka in 1842, just as he was about to embark for Russia: "His appearance, to which I have already alluded, impresses a stranger with something of awe, while in further intercourse the gentleness which characterizes his every word and deed insensibly molds reverence into love; and, at the same time, his talents and attainments are such as to be worthy of his exalted station. With all this, the bishop is sufficiently a man of the world to disdain anything like cant. His conversation, on the contrary, teems with amusement and instruction, and his company is much prized by all who have the honor of his acquaintance." Such is the portrait drawn of him by a governor of the Hudson Bay Company. [Veniaminov died since the above note was written, at Moscow, April 22, 1879.—H. W. E.]

tion at this island is a scant 2½ miles; but for that matter there was, at the time of my arrival and in the beginning of my investigation, a score of equally wild and incredible legends afloat in regard to the rookeries on St. Paul and St. George. Finding, therefore, that the whole work must be undertaken de novo, I set about it without further delay.

IMMENSE MORTALITY OF THE SEALS IN 1836.—Prior to the year 1835 no native on the islands seemed to have any direct knowledge, or was acquainted with a legendary tradition, even, in relation to the seals, concerning their area and distribution on the land here; but they all chimed in after that date with great unanimity, saying that the winter preceding this season (1835–36) was one of frightful severity; that many of their ancestors who had lived on these islands in large barrabaras just back of the Black Bluffs, near the present village, and at Polavina, then perished miserably.

They say that the cold continued far into the summer; that immense masses of clearer and stronger ice floes than had ever been known to the waters about the islands, or were ever seen since, were brought down and shoved high up on to all the rookery margins, forming an icy wall completely around the island, looming up 20 to 30 feet above the surf; they further state that this wall did not melt or in any way disappear until the middle or end of August, 1836.

They affirm that for this reason the fur seals, when they attempted to land, according to their habit and their necessity, during June and July, were unable to do so in any considerable numbers. The females were compelled to bring forth their young in the water and at the wet, storm-beaten, surf margins, which caused multitudes of the mothers and all of the young to perish. In short, the result was a virtual annihilation of the breeding seals. Hence, at the following season, only a spectral, a shadowy imitation of past times could be observed upon the seal grounds of St. Paul and St. George.

On the Lagoon rookery, now opposite the village of St. Paul, there were then only two males, with a number of cows. At Nah Speel, close by and right under the village, there were then only some 2,000; this the natives know because they counted them. On Zapadnie there were about 1,000 cows, bulls, and pups; at Southwest Point there were none. Two small rookeries were then on the north shore of St. Paul, near a place called Maroonitch; and there were seven small rookeries running around Northeast Point, but on all of these there were only 1,500 males, females, and young; and this number includes the "holluschickie," which, in those days, lay in among the breeding seals, there being so few old males that they were gladly permitted to do so. On Polavina there were then about 500 cows, bulls, pups, and "holluschickie;" on Lukannon and Keetavie about 300; but on Keetavie there were only 10 bulls and so few young males lying in altogether, that these old natives, as they told me, took no note of them on the rookeries just cited. On the Reef, in Gorbotch, were about 1,000 only; in this number last mentioned some 800 "holluschickie" may be included, which lay in with the breeding seals. There were only 20 old bulls on Gorbotch, and about 10 old males on the Reef. The village was placed on its present site ten years prior to this period of 1835–36.

Such, briefly and succinctly, is the sum and the substance of all information which I could gather prior to 1835–36; and while I do not entirely credit these statements, yet the earnest, straightforward agreement of the natives has impressed me so that I narrate it here.

It certainly seems as though this enumeration of the old Aleuts was painfully short.

Then, again, with regard to the probable truth of the foregoing statement of the natives, perhaps I should call attention to the fact that the entire sum of seal life in 1836, as given by them, is just 4,100, of all classes, distributed as I have indicated above. Now, on turning to Bishop Veniaminov, by whom was published the only statement of any kind in regard to the killing on these islands from 1817 to 1837, the year when he finished his work,[1] I find that he makes a record of slaughter of seals in the year 1836 of 4,052, which were killed and taken for their skins; but if the natives' statements are right, then only 50 seals were left on the island for 1837, in which year, however, 4,220 were again killed, according to the bishop's table, according to which there was also a steady increase in the size of this return from that date along up to 1850, when the Russians governed their catch by the market alone, always having more seals than they knew what to do with.

Again, in this connection, the natives say that until 1847 the practice on these islands was to kill indiscriminately both females and males for skins, but after this year, 1847, the strict respect now paid to the breeding seals and exemption of all females was enforced for the first time and has continued up to date.

Thus it will be seen that there is, frankly stated, nothing to guide to a fair or even an approximate estimate as to the numbers of the fur seals on these two islands prior to my labor.

MANNER OF COMPUTING THE NUMBER OF SEALS.—After a careful study of the subject during three entire consecutive seasons, and a confirmatory review of it in 1876, I feel confident that the following figures and surveys will, upon their own face, speak authoritatively as to their truthful character.

At the close of my investigation, during the first season of my labor on the ground, in 1872, the fact became evident that the breeding seals obeyed implicity an imperative and instinctive natural law of distribution; a law recognized by each and every seal upon the rookeries, prompted by a fine consciousness of necessity to its own well-being. The breeding grounds occupied by them were therefore invariably covered by the seals in exact ratio, greater or less, as the area upon which they rested was larger or smaller. They always covered the ground evenly, never crowding in at one place here to scatter out there. The seals lie just as thickly together where the rookery is boundless in its eligible area to their rear and unoccupied by them as they do in the little strips which are abruptly cut off and narrowed by rocky walls behind. For instance, on a rod of ground under the face of bluffs which hemmed it in to the land from the sea there are just as many seals, no more and no less, as will be found on any other rod of rookery ground throughout the whole list, great and small; always exactly so many seals, under any and all circumstances, to a given area of breeding ground. There are just as many cows, bulls, and pups on a square rod at Nah Speel, near the village, where, in 1874, all told, there were only seven or eight thousand, as there are on any square rod at Northeast Point, where a million of them congregate.

This fact being determined, it is evident that just in proportion as the breeding grounds of the fur seal on these islands expand or contract in area from their present dimensions the seals will increase or diminish in number.

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[1] Zapieskie ob Oonalashkenskaho Otdayla, St. Petersburg, 1842.

The discovery, at the close of the season of 1872, of this law of distribution gave me at once the clue I was searching for in order to take steps by which I could arrive at a sound conclusion as to the entire number of seals herding on the island.

I noticed, and time has confirmed my observation, that the period for taking these boundaries of the rookeries, so as to show this exact margin of expansion at the week of its greatest volume, or when they are as full as they are to be for the season, is between the 10th and 20th of July every year; not a day earlier, and not many days later. After the 20th of July the regular system of compact, even organization, breaks up. The seals then scatter out in pods or clusters, the pups leading the way, straying far back—the same number instantly covering twice and thrice as much ground as they did the day or week before, when they lay in solid masses and were marshaled on the rookery ground proper.

There is no more difficulty in surveying these seal margins during this week or ten days in July than there is in drawing sights along and around the curbs of a stone fence surrounding a field. The breeding seals remain perfectly quiet under your eyes all over the rookery, and almost within your touch, everywhere on the outside of their territory that you may stand or walk. The margins of massed life, as I have indicated on the topographical surveys of these breeding grounds of St. Paul and St. George, are as clean cut and as well defined against the soil and vegetation as is the shading on my maps. There is not the least difficulty in making the surveys, and in making them correctly.

Now, with a knowledge of the superficial area of these breeding grounds, the way is clearly open to a very interesting calculation as to the number of fur seals upon them. I am well aware of the fact, when I enter upon this discussion, that I can not claim perfect accuracy, but, as shadowing my plan of thought and method of computation, I propose to present every step in the processes which have guided me to the result.

ROOKERY SPACE OCCUPIED BY SINGLE SEALS.—When the adult males and females, 15 or 20 of the latter to every 1 of the former, have arrived upon the rookery, I think an area a little less than 2 square feet for each female may be considered as the superficial space required by each animal with regard to its size and in obedience to its habits, and this limit may safely be said to be over the mark. Now, every female, or cow, on this 2 square feet space doubles herself by bringing forth her young, and in a few days or a week, perhaps, after its birth the cow takes to the water to wash and feed, and is not back on this allotted space one-fourth of the time again during the season. In this way is it not clear that the females almost double their number on the rookery grounds without causing the expansion of the same beyond the limits that would be actually required did they not bear any young at all? For every 100,000 breeding seals there will be found more than 85,000 females and less than 15,000 males, and in a few weeks after the landing of these females they will show for themselves; that is, for this 100,000, fully 180,000 males, females, and young instead, on the same area of ground occupied previously to the birth of the pups.

It must be borne in mind that perhaps 10 or 12 per cent of the entire number of females were yearlings last season and come up onto these breeding grounds as virgins for the first time during this season, as 2-year-old cows. They, of course, bear no young.

The males, being treble and quadruple the physical bulk of the

females, require about 4 feet square for their use of this same rookery ground, but as they are less than one-fifteenth the number of the females—much less, in fact—they therefore occupy only one-eighth of the space over the breeding ground where we have located the supposed 100,000. This surplus area of the males is also more than balanced and equalized by the 15,000 or 20,000 virgin females which come on to this rookery for the first time to meet the males. They come, rest a few days or a week, and retire, leaving no young to show their presence on the ground.

Taking all these points into consideration, and they are features of fact, I quite safely calculate upon an average of 2 square feet to every animal, big and little, on the breeding grounds, as the initial point upon which to base an intelligent computation of the entire number of seals before us. Without following this system of enumeration, a person may look over these swarming myriads between Southwest Point and Novastoshnah, guessing vaguely and wildly, at any figure from 1,000,000 up to ten or twelve millions, as has been done repeatedly. How few people know what a million really is. It is very easy to talk of a million, but it is a tedious task to count it off, and makes one's statements as to "millions" decidedly more conservative after the labor has been accomplished.

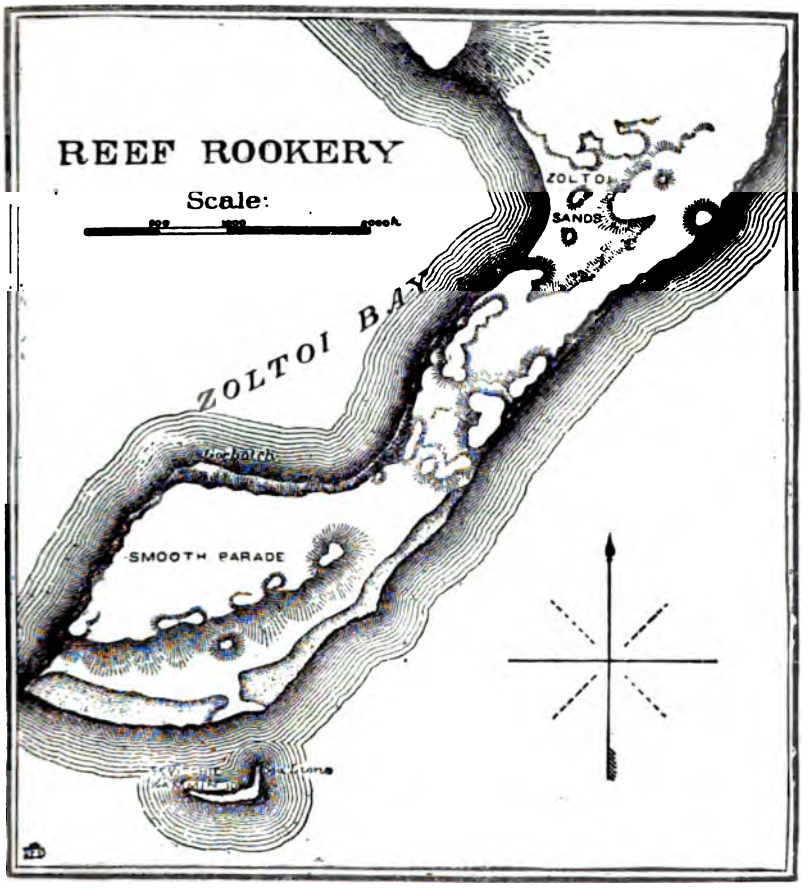
REVIEW OF THE ROOKERIES OF ST. PAUL.—Before summing up the grand total, I shall now, in sequence, review each one of the several rookeries of St. Paul, taking them in their order as they occur, going north from the Reef Point. The accompanying maps show the exact area occupied by the breeding seals and their young in the season of 1874, which is the date of my latest fieldwork on the Pribilof Islands.

THE REEF ROOKERY.—By reference first to the general map, it will be observed that this large breeding ground, on that grotesquely shaped neck which ends in the Reef Point, is directly contiguous to the village—indeed, it may be fairly said to be right under the lee of the houses on the hill. It is one of the most striking of all the rookeries, owing probably to the fact that on every side it is sharply and clearly exposed to the vision, as the circuit is made in boats. A reach of very beautiful drifting sand, a quarter of a mile from the village hill to the Reef Bluffs, separates the breeding grounds proper from the habitations of the people. These Zoltoi sands are, however, a famous rendezvous for the "holluschickie," and from them, during the season, the natives make regular drives, having only to step out from their houses in the morning and walk but a few rods to find their fur-bearing quarry.

Passing over the sands on our way down to the point, we quickly come to a basaltic ridge or backbone, over which the sand has been rifted by the winds, and which supports a rank and luxuriant growth of the elymus and other grasses, with beautiful flowers. A few hundred feet farther along our course brings us in full view, as we look to the south, of one of the most entrancing spectacles which seals afford to man. We look down upon and along a grand promenade ground, which slopes gently to the eastward and trends southward down to the water from the abrupt walls bordering on the sea on the west, over a parade plateau as smooth as the floor of a ball-room, 2,000 feet in length, from 500 to 1,000 feet in width, over which multitudes of "holluschickie" are filing in long strings or deploying in vast platoons, hundreds abreast, in an unceasing march and countermarch. The breath which rises into the cold air from a hundred thousand hot

throats hangs like clouds of white steam in the gray fog itself; indeed, it may be said to be a seal-fog peculiar to the spot, while the din, the roar, arising over all, defies our description.

We notice to our right and to our left the immense solid masses of the breeding seals at Gorbotch, and those stretching and trending around nearly a mile from our feet, far around to the Reef Point below and opposite the parade ground, with here and there a neutral passage left open for the "holluschickie" to go down and come up from the waves.



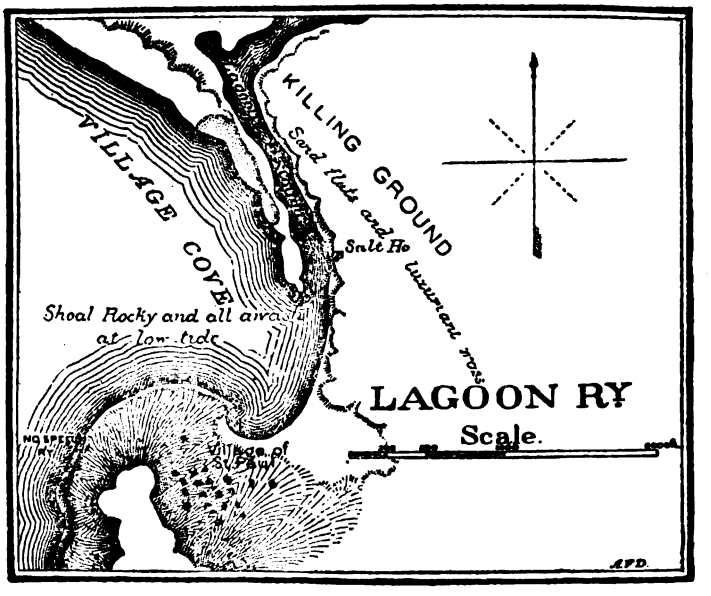
The adaptation of this ground of the Reef rookery to the requirements of the seal is perfect. It so lies that it falls gently from its high Zoltoi Bay margin on the west to the sea on the east; and upon its broad expanse not a solitary puddle of mud spotting is to be seen, though everything is reeking with moisture, and the fog even dissolves into rain as we view the scene. Every trace of vegetation upon this parade has been obliterated; a few tufts of grass, capping the summits of those rocky hillocks, indicated on the eastern and middle slope, are the only signs of botanical life which the seals have suffered to remain.

A small rock, "Seevitchie Kammin," 500 or 600 feet right to the

southward and out at sea, is also covered with the black and yellow forms of fur seals and sea lions. It is environed by shoal reefs, rough and kelp-grown, which navigators prudently avoid.

This rookery of the Reef proper has 4,016 feet of sea margin, with an average depth of 150 feet, making ground for 301,000 breeding seals and their young. Gorbotch rookery has 3,660 feet of sea margin, with an average depth of 100 feet, making ground for 183,000 breeding seals and their young; an aggregate for this great Reef rookery of 484,000 breeding seals and their young. Heavy as this enumeration is, yet the aggregate only makes the Reef rookery third in importance, compared with the others which we are yet to describe.

LAGOON ROOKERY.—We now pass from the Reef up to the village, where one naturally would not expect to find breeding seals within less than a pistol shot from the natives' houses; but it is a fact, nevertheless, for on looking at the sketch map of the Lagoon rookery herewith presented, it will be noticed that I have located a little gathering of breeding seals right under the village hill to the westward of that



place called Nah Speel. This is in itself an insignificant rookery and never has been a large one, though it is one of the oldest on the island. It is only interesting, however, superficially so, on account of its position, and the fact that through every day of the season half the population of the entire village go and come to the summit of the bluff, which overhangs it, where they peer down for hours at a time upon the methods and evolutions of the "kautickie" below, the seals themselves looking up with intelligent appreciation of the fact that, though they are in the hands of man, yet he is wise enough not to disturb them there as they rest.

If at Nah Speel, or that point rounding into the village cove, there were any suitable ground for a rookery to grow upon or spread over, the seals would doubtless have been there long ago. There are, however, no such natural advantages offered them; what there is they have availed themselves of.

Looking from the village across the cove and down upon the Lagoon, still another strange contradiction appears—at least it seems a natural contradiction to one's usual ideas. Here we see the Lagoon rookery, a reach of ground upon which some twenty-five or thirty thousand breeding seals come out regularly every year during the appointed time and go through their whole elaborate system of reproduction, without showing the slightest concern for or attention to the scene directly east of them and across that shallow slough not 40 feet in width. There are the great slaughtering fields of St. Paul Island; there are the sand flats where every seal has been slaughtered for years upon years back for its skin; and even as we take this note 40 men are standing there knocking down a drove of two or three thousand "holluschickie" for the day's work, and as they labor the whacking of their clubs and the sound of their voices must be as plain to those breeding seals, which are not 100 feet from them, as it is to us, a quarter of a mile distant! In addition to this enumeration of disturbances, well calculated to amaze and dismay and drive off every seal within its influence, are the decaying bodies of the last year's catch—75,000 or 85,000 unburied carcasses—that are sloughing away into the sand, which two or three seasons from now nature will, in its infinite charity, cover with the greenest of all green grasses. The whitened bones and grinning skulls of over 3,000,000 seals have bleached out on that slaughtering spot and are buried below its surface now.

Directly under the north face of the Village Hill, where it falls to the narrow flat between its feet and the Cove, the natives have sunk a well. It was excavated in 1857, they say, and subsequently deepened to its present condition in 1868. It is 12 feet deep, and the diggers said that they found bones of the sea lion and fur seal thickly distributed every foot down, from top to bottom. How much lower these osteological remains of prehistoric pinnipeds can be found no one knows as yet. The water here, on that account, has never been fit to drink, or even to cook with, but being soft, was and is used by the natives for washing clothes, etc. Most likely it records the spot where the Russians, during the heydays of their early occupation, drove the unhappy visitors of Nah Speel to slaughter. There is no Golgotha known to man elsewhere in the world as extensive as this one of St. Paul.

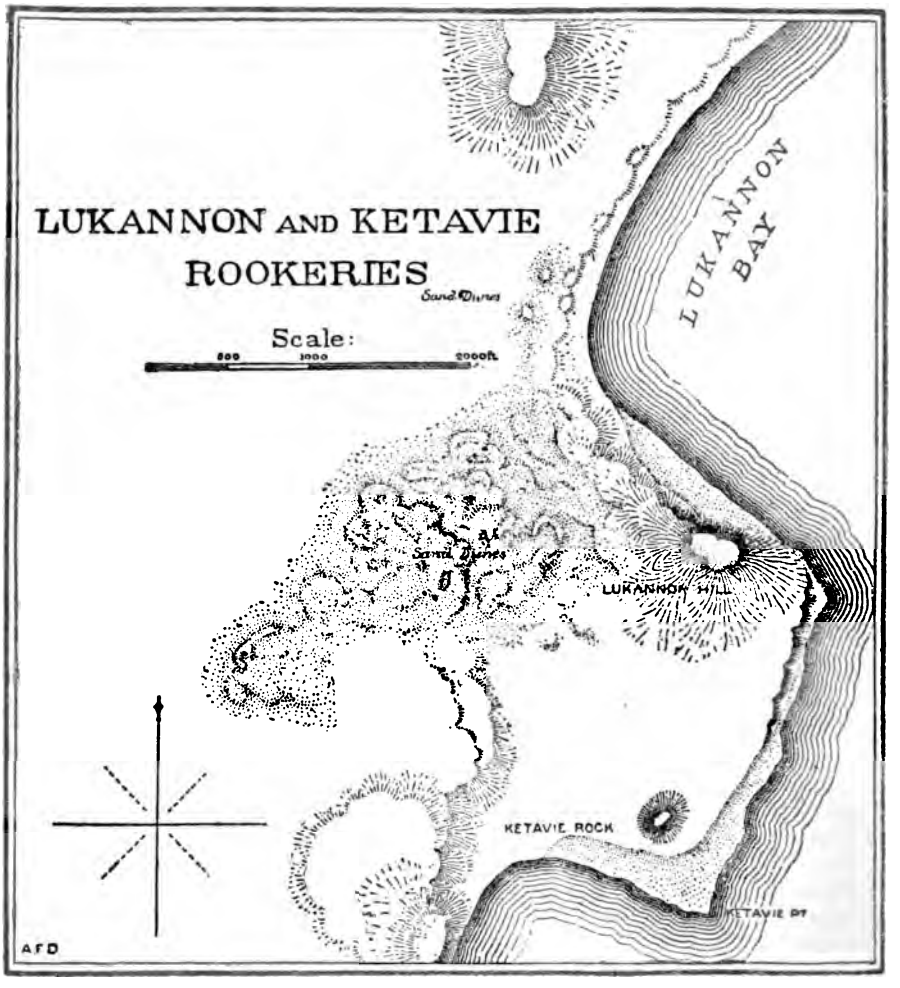
Yet the natives say that this Lagoon rookery is a new feature in the distribution of the seals; that when the people first came there and located a part of the present village, in 1824 up to 1847, there never had been a breeding seal on that Lagoon rookery of to-day. So they have hauled up here from a small beginning not very long ago, until they have attained their present numerical expansion, in spite of all these exhibitions of butchery of their kind, executed right under their eyes and in full knowledge of their nostrils, while the groans and low moanings of their stricken species stretched out beneath the clubs of the sealers must have been far plainer in their ears than they are in our own.

Still they come—they multiply and they increase—knowing so well that they belong to a class which intelligent men never did molest; to-day at least they must know it, or they would not submit to these manifestations which we have just cited, so close to their knowledge.

The Lagoon rookery, however, never can be a large one, on account of the very nature of the ground selected by the seals, for it is a bar simply pushed up above the surf wash of bowlders, waterworn and rounded, which has almost inclosed and cut out the Lagoon from its

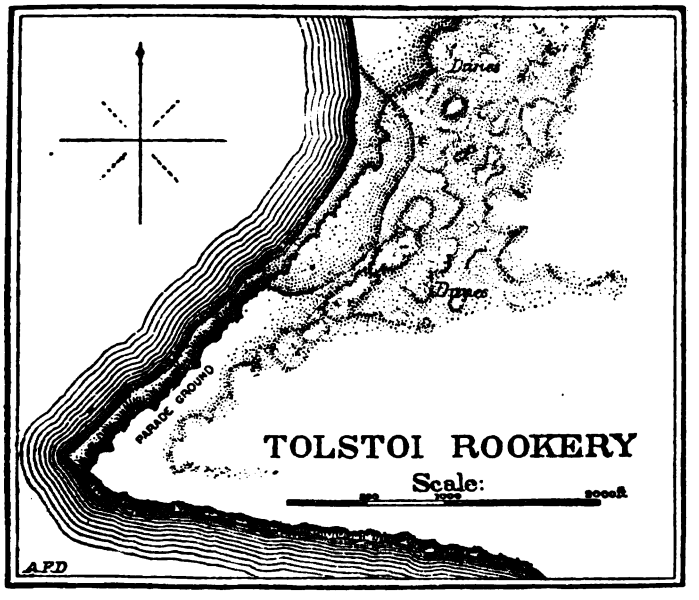
parent sea. In my opinion, the time is not far distant when that estuary will be another inland lake of St. Paul, walled out from salt water and freshened by rain and melting snow, as are the other pools, lakes, and lakelets on the island.

LUKANNON AND KEETAVIE ROOKERIES.—The next rookeries in order can be found at Lukannon and Keetavie. Here is a joint blending of two large breeding grounds, their continuity broken by a short reach of sea wall right under and at the eastern foot of Lukannon Hill.



The appearance of these rookeries is like all the others, peculiar to themselves. There is a rounded, swelling hill at the foot of Lukannon Bay, which rises perhaps 160 or 170 feet from the sea abruptly at the point, but swelling out, gently up from the sand dunes in Lukannon Bay, to its summit at the northwest and south. The great rookery rests upon the northern slope. Here is a beautiful adaptation of the finest drainage, with a profusion of those rocky nodules scattered everywhere over it, upon which the females so delight in resting.

Standing on the bald summit of Lukannon Hill, we turn to the south, and look over Keetavie Point, where another large aggregate of breeding seals rests under our eye. The hill falls away into a series of faintly terraced tables, which drop down to a flat that again abruptly descends to the sea at Keetavie Point. Between us and the Keetavie rookery is the parade ground of Lukannon, a sight almost as grand as is that on the reef which we have feebly attempted to portray. The sand dunes to the west and to the north are covered with the most luxuriant grass, abruptly emarginated by the sharp abrasion of the hauling seals; this is shown very clearly on the general map. Keetavie Point is a solid basaltic shelf. Lukannon Hill, the summit of it, is composed of volcanic tufa and cement, with irregular cubes and fragments of pure basalt scattered all over its flipper-worn slopes. Lukannon proper has 2,270 feet of sea margin, with an average depth of 150 feet, making ground for 170,000 breeding seals



and their young. Keetavie rookery has 2,200 feet of sea margin, with an average depth of 150 feet, making ground for 165,000 breeding seals and their young, a whole aggregate of 335,000 breeding seals and their young. This is the point, down along the flat shoals of Lukannon Bay, where the sand dunes are most characteristic, as they rise in their wind-whirled forms just above the surf wash. This also is where the natives come from the village during the early mornings of the season, for driving, to get any number of "holluschickie."

It is a beautiful sight, glancing from the summit of this great rookery hill up to the north over that low reach of the coast to Tonkie Mees, where the waves seem to roll in with crests that rise in unbroken ridges for a mile in length each ere they break so grandly and uniformly on the beach. In these rollers the "holluschickie" are playing like sea birds, seeming to sport the most joyously at the very moment when the heavy billow breaks and falls upon them.

TOLSTOI ROOKERY.—Directly to the west from Lukannon, up along

and around the head of the lagoon, is the seal-path road over which the natives bring the "holluschickie" from Tolstoi. We follow this and take up our position on several lofty grass-grown dunes close to and overlooking another rookery of great size; this is Tolstoi.

We have here the greatest hill slope of breeding seals on either island, peculiarly massed on the abruptly sloping flanks of Tolstoi Ridge, as it falls to the sands of English Bay and ends suddenly in the precipitous termination of its own name, Tolstoi Point. Here the seals are in some places crowded up to the enormous depth of 500 measured feet, from the sea margin of the rookery to its outer boundary and limitation; and, when viewed as I viewed it in July, taking the angles and lines shown on the accompanying sketch map, I considered it, with the bluffs terminating it at the south and its bold sweep, which ends on the sands of English Bay, to be the most picturesque, though it is not the most impressive, rookery on the island, especially when that parade ground, lying just back and over the point and upon its table-rock surface, is reached by the climbing seals.

If the observer will glance at the map, he will see that the parade ground in question lies directly over and about 150 feet above, the breeding seals immediately under it. The sand-dune tracts which border the great body of the rookery seem to check the "holluschickie" from hauling to the rear, for sand drifts here, in a locality so high and exposed to the full force of the wind, with more rapidity, and consequently more disagreeable energy to the seals, than anywhere else on the island.

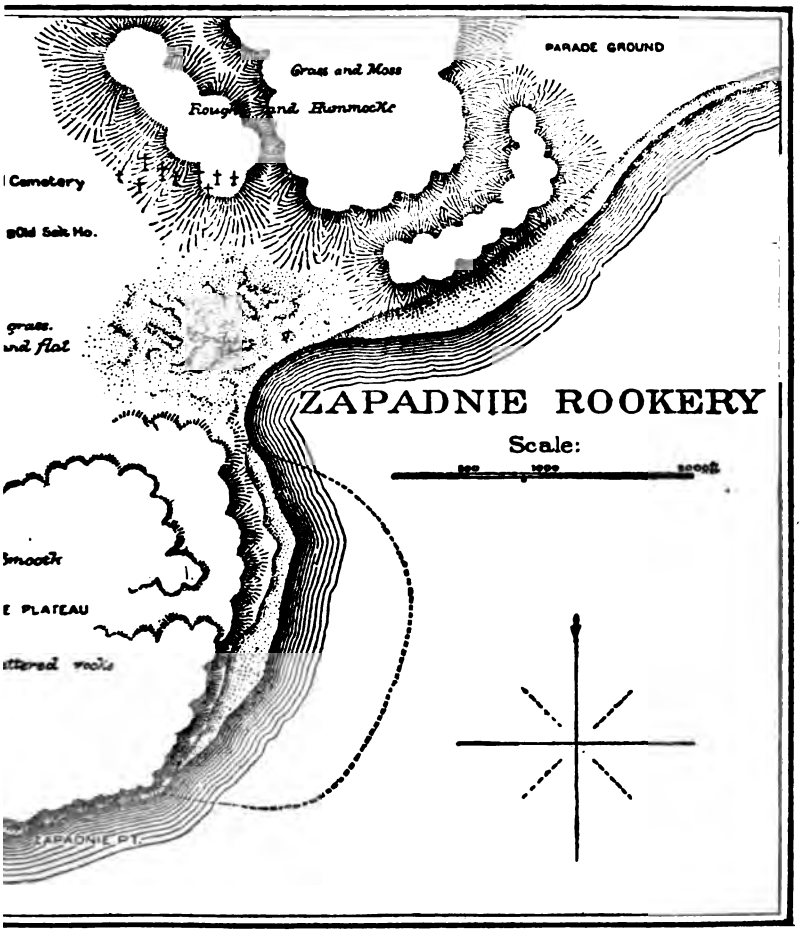
A comical feature of this rookery is the appearance of the foxes in the chinks under the parade ground and interstices of the cliffs. Their melancholy barking and short yelps of astonishment as we walk about contrast quite sensibly with the utter indifference of the seals to our presence.

From Tolstoi at this point, sweeping around 3 miles to Zapadnie, is the broad sand reach of English Bay, upon which and back over its gently rising flats are the great hauling grounds of the "holluschickie," which I have indicated on the general map, and to which I made reference in a previous section of this chapter. Looking at the myriads of "bachelor seals" spread out in their restless hundreds and hundreds of thousands upon this ground, one feels the utter impotency of verbal description, and reluctantly shuts his note and sketch books to gaze upon it with renewed fascination and perfect helplessness.

Tolstoi rookery has attained, I think, its utmost limit of expansion. The seals have already pushed themselves as far out upon the sand at the north as they can or are willing to go, while the abrupt cliffs, hanging over more than one-half of the sea margin, shut out all access to the rear for the breeding seals. The natives said that this rookery had increased very much during the last four or five years prior to the date of my making the accompanying survey. If it continues to increase, the fact can be instantly noted by checking off the ground and comparing it with the sketch map herewith presented. Tolstoi rookery has 3,000 feet of sea margin, with an average depth of 150 feet, making ground for 225,000 breeding seals and their young.

ZAPADNIE ROOKERY.—From Tolstoi, before going north, we turn our attention directly to Zapadnie on the west, a little over 2 miles as the crow flies, across English Bay, which lies between them. Here again we find another magnificent rookery, with features peculiar to itself, consisting of great wings separating, one from the other, by a short stretch of 500 or 600 feet of the shunned sand reach which makes

ling and a beach just between them. The northern Zapadnie ıostly on the gently sloping, but exceedingly rocky, flats of a volcanic ridge which drops there to the sea; it, too, has an ximation to the Tolstoi depth, but not to such a solid extent; it one rookery which I have reason to believe has sensibly increased my first survey in 1872. It has overflowed from the boundary I laid down at that time, and has filled up for nearly half a ı long ribbon-like strip of breeding ground to the northeast from ll slope, ending at a point where a few detached rocks jut out,



he sand takes exclusive possession of the rest of the coast. rocks aforesaid are called by the natives Nearhpahskie kammin, se it is a favorite resort for the hair seals. Although this exten- f a very decided margin of breeding ground, over half a mile in ı, between 1872 and 1876, does not, in the aggregate, point to a large increased number, still it is a gratifying evidence that the ries, instead of tending to diminish in the slightest, are more holding their own.

adnie, in itself, is something like the Reef plateau on its eastern

face, for it slopes up gradually and gently to the parade plateau on top—a parade ground not so smooth, however, being very rough and rocky, but which the seals enjoy. Just around the point, a low reach of rocky bar and beach connects it with the ridge walls of Southwest Point; a very small breeding rookery, so small that it is not worthy of a survey, is located here; I think, probably, on account of the nature of the ground, that it will never hold its own, and is more than likely abandoned by this time.

One of the prehistoric villages, the village of Pribilof's time, was established here between the point and the Cemetery Ridge, on which the northern wing of Zapadnie rests. The old burying ground, with its characteristic Russian crosses and faded pictures of the saints, is plainly marked on the ridge. It was at this little bight of sandy landing that Pribilof's men first came ashore and took possession of the island, while others in the same season proceeded to Northeast Point and to the north shore, to establish settlements of their own order. When the indiscriminate sealing of 1868 was in progress, one of the parties lived here, and a salt house which was then erected by them still stands. It is in a very fair state of preservation, although it has never been since occupied, except by the natives who come over here from the village in the summer to pick the berries of the *Empetrum* and *Rubus*, which abound in the greatest profusion around the rough and rocky flats that environ the little adjacent lake. The young people of St. Paul are very fond of this berry festival, so called among themselves, and they stay here every August, camping out, a week or ten days at a time, before returning to their homes in the village.

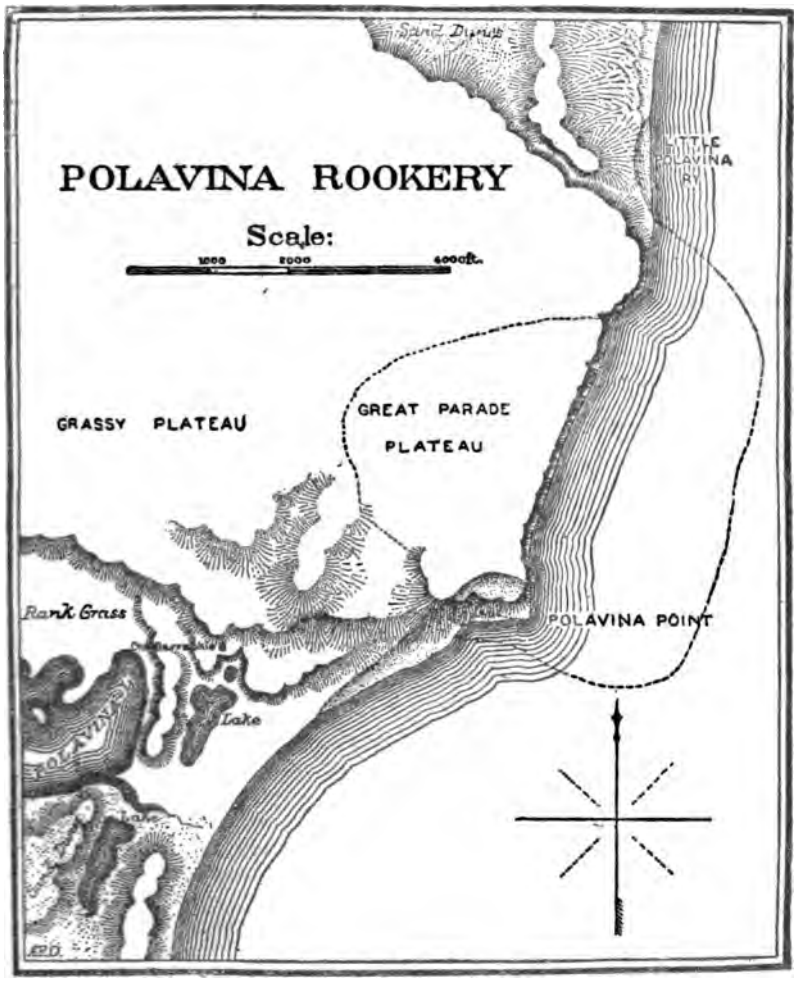
Zapadnie rookery has, the two wings included, 5,880 feet of sea margin, with an average depth of 150 feet, making ground for 441,000 breeding seals and their young, being the second rookery on the island as to size and importance.

The "holluschickie" that sport here on the parade plateau, and indeed over all of the western extent of the English Bay hauling grounds, have never been visited by the natives for the purpose of selecting killing drives since 1872, inasmuch as more seals than were wanted have always been procured from Zoltoi, Lukannon, and Lower Tolstoi points, which are all very close to the village. I have been told, since making this survey, that during the past year the breeding seals of Zapadnie have overflowed, so as to occupy all of the sand strip which is vacant between them on the accompanying map.

POLAVINA ROOKERY.—Halfway between the village and Northeast Point lies Polavina, another one of the seven large breeding grounds on this island. The conspicuous cone-shaped head of Polavina Sopka rises clearly cut and smooth from the plateau at its base, which falls 2 miles to the eastward and southeastward, sharp off into the sea, presenting a bluff margin over a mile in length, at the base of which the sea thunders incessantly. It exhibits a very beautiful geological section of the simple structure of St. Paul. The ringing, iron-like basaltic foundations of the island are here setting boldly up from the sea to a height of 40 or 50 feet—black and purplish red, polished like ebony by the friction of the surf, and worn by its agency into grotesque arches, tiny caverns, and deep fissures. Surmounting this lava bed is a cap of ferruginous cement and tufa from 3 to 10 feet in thickness, making a reddish floor, upon which the seals patter in their restless, never-ceasing evolutions, sleeping or waking, on the land. It is as great a single parade plateau of polished cement as that of the Reef,

but we are unable from any point of observation to appreciate it, inasmuch as we can not stand high enough to overlook it, unless we ascend Polavina Sopka, and then the distances, with the perspective foreshortening, destroy the effect.

The rookery itself occupies only a small portion of the seal-visited area at this spot. It is placed at the southern termination and gentle sloping of the long reach of bluff wall, which is the only cliff between Lukannon and Novastoshnah. It presents itself to the eye, however,



in a very peculiar manner and with great scenic effect when the observer views it from the extreme point of its mural elevation. Viewed from thence, nearly a mile to the northeast, it rises as a front of bicolored lava wall, high above the sea that is breaking at its base, and is covered with the infinite detail of massed seals in reproduction. At first sight one wonders how they got there. No passages whatever can be seen, down or up. A further survey, however, discloses the common occurrence of rain-water runs between surf-beaten crevices,

which make many stairways for the adhesive feet of *Callorhinus* amply safe and comfortable.

For the reason cited in a similar example at Zapadnie no "hollus-chickie" have been driven from this point since 1872, though it is one of the easiest worked. It was, in the Russian times, a pet sealing ground with them. The remains of the old village have nearly all been buried in the sand near the lake, and there is really no mark of its early habitation, unless it be the singular effect of a human grave-yard being dug out and despoiled by the attrition of seal bodies and flippers. The old cemetery just above and to the right of the barrabkie, near the little lake, was originally established, so the natives told me, far away from the hauling of the "holluschickie;" it was, when I saw it in 1876, in a melancholy state of ruin—a thousand young seals, at least, moved off from its surface as I came up, and they had actually trampled out many sandy graves, rolling the bones and skulls of Aleutian ancestry in every direction. Beyond this old barrabkie, which the present natives established as a house of refuge during the winter when they were trapping foxes, looking to the west over the lake, is a large expanse of low, flat swale and tundra, which is terminated by the rocky ridge of Kaminista; every foot of it has been placed there subsequent to the original elevation of the island by the action of the sea, beyond all question. It is covered with a thick growth of the rankest sphagnum, which quakes and trembles like a bog under one's feet, but over which the most beautiful mosses ever and anon crop out, including the characteristic floral display before referred to in speaking of the island. Most of the way from the village up to Northeast Point, as will be seen by a cursory glance at the map, with the exception of this bluff of Polavina and the terraced table setting back from its face to Polavina Sopka, the whole island is slighly elevated above the level of the sea, and its coast line is lying just above and beyond the reach of the surf, where great ledges of sand have been piled up by the wind, capped with sheafs and tufts of rank-growing elymus.

There is a small rookery, which I call Little Polavina, indicated here, which does not promise much for the future; the sand cuts it off on the north, and sand has blown around so at its rear as to make all other ground not now occupied by the breeding seals there quite ineligible. Polavina rookery has 4,000 feet of sea margin, including Little Polavina, with 150 feet of average depth, making ground for 300,000 breeding seals and their young.

NORTHEAST POINT OR NOVASTOSHNAH ROOKERY.—Though this is the last of the St. Paul rookeries which I notice, yet it is so much greater than any other one on the island, or two others for that matter, that it forms the central feature of St. Paul, and in truth presents a most astonishing and extraordinary sight. It was a view of such multitudes of amphibians, when I first stood upon the summit of Hutchinson Hill and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me courage to maintain the truth in regard to the subject.

The result of my first survey here presented such a startling array of superficial area massed over by the breeding seals, that I was fairly disconcerted at the magnitude of the result. It troubled me so when my initial plattings were made—and I had worked them out so as to place them tangibly before me—that I laid the whole preliminary survey aside, and seizing upon the next favorable day went over the

entire field again. The two plats then, laid side by side, substantially agreed, and I now present the great rookery to the public. It is in itself, as the others are, endowed with its own particular physiognomy, having an extensive sweep, everywhere surrounded by the sea, except at that intersection of the narrow neck of sand which joins it to the main island. Hutchinson Hill is the foundation of the point—a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner, which is so rough, and yet polished so highly by the constantly pattering flippers of its visitors, as to leave it entirely bare and bald of every spear of grass or trace of cryptogamic life. The hill is about 120 feet high; it has a rounded summit, flecked entirely over by the "holluschickie," while the great belt of breeding rookery sweeps high up on its flanks and around right and left for nearly 3½ miles unbroken—an amazing sight in its aggregate, and infinite in its detail.

The picturesque feature, also, of the rookery here is the appearance of the tawny, yellowish bodies of several thousand sea lions, which lay in and among the fur seals at the several points designated on the sketch-map, though never far from the water. Sea Lion Neck, a little tongue of low basaltic jutting, is the principal corner where the natives take these animals from when they capture them in the fall for their hides and sinews.[1]

Cross, or St. Johns, Hill, which rises near the lake to a height of 60 or 70 feet, and is quite a landmark itself, is a perfect cone of sand entirely covered with a luxuriant growth of elymus; it is growing constantly higher by the fresh deposit brought by wind, and its retention by the annually rising grasses.

At this point, it will be noticed, there is a salt house, and here is the killing ground for Northeast Point, where 19,000 or 20,000 "holluschickie" are disposed of for their skins every season; their carcasses being spread out on the sand dunes between the foot of Cross Hill and Webster's house; a squad of sealers live there during the three or four weeks that they are engaged in the work. The "holluschickie" are driven from the large hauling grounds on the sand flats immediately adjacent to the killing grounds, being obtained without the slighest difficulty.

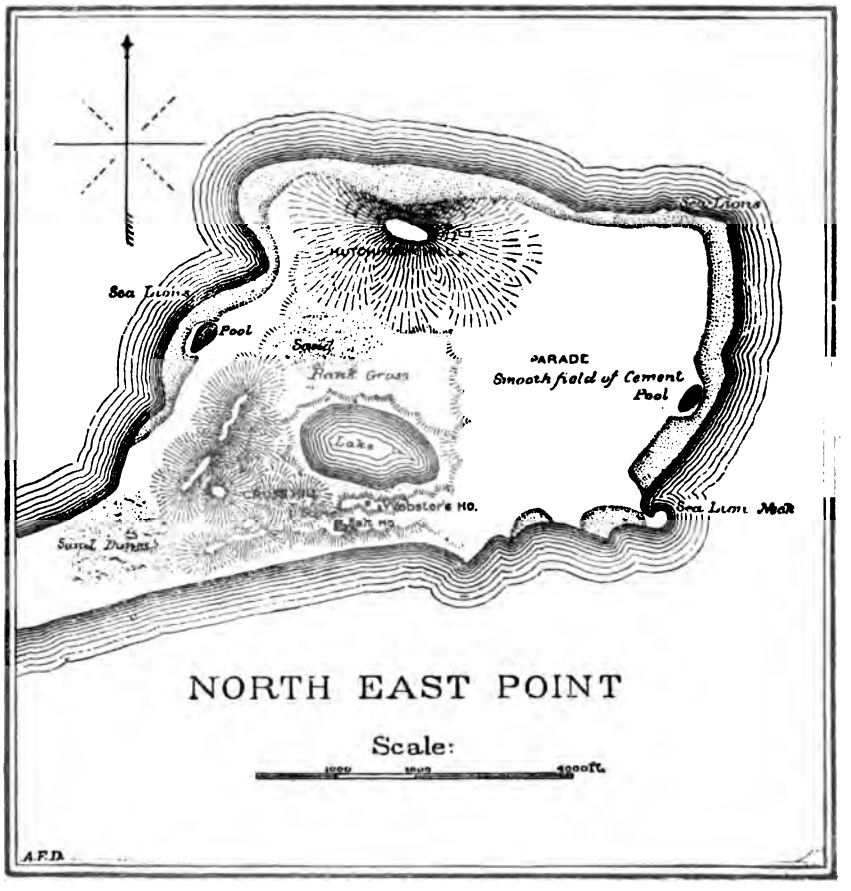
Here also was the site of a village, once the largest one on this island ere its transfer to the sole control and charge of the old Russian-American Company, ten years after its discovery in 1787. The ancient cemetery and the turf lines of the decayed barraboras are still plainly visible.

The company's steamer runs up here, watching her opportunity, and drops her anchor, as indicated on the general chart, right south of the salt house, in about 4 fathoms of water; and the skins are invariably hustled aboard, no time being lost, because it is an exceedingly uncertain place to safely load the vessel.

There is no impression in my mind really more vivid than is the one which was planted there during the afternoon of that July day, when I first made my survey of this ground; indeed, whenever I pause to think of the subject, the great rookery of Novastoshnah rises promptly

[1] The sea lions breed on no one of the other rookeries at this island, the insignificant number that I noticed on Seevitchie Kammin excepted. At Southwest Point, however, I found a small sea-lion rookery, but there are no breeding fur seals there. A handful of *Eumetopias* used to breed on Otter Island, but do not now, since it has been necessary to station Government agents there, for the apprehension of fur-seal pirates, during the sealing season.

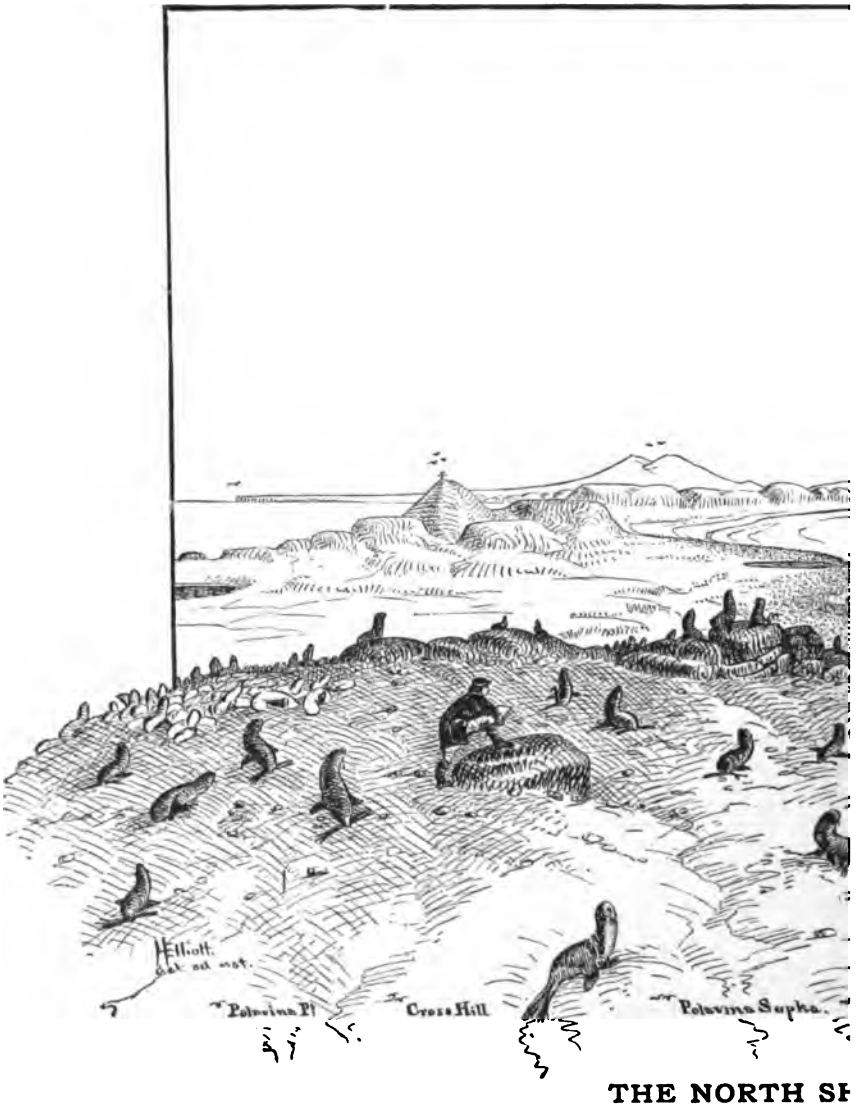
to my view, and I am fairly rendered voiceless as I try to speak in definition of the spectacle. In the first place, this slope from Sea Lion Neck to the summit of Hutchinson's Hill is a long mile, smooth and gradual from the sea to the hilltop; the parade ground lying between is also nearly three-fourths of a mile in width, sheer and unbroken. Now, upon that area before my eyes, this day and date of which I have spoken, were the forms of not less than three-fourths of a million seals—pause a moment—think of the number—three-fourths of a million seals moving in one solid mass from sleep to frolicsome gambols,



backward, forward, over, around, changing and interchanging their heavy squadrons, until the whole mind is so confused and charmed by the vastness of mighty hosts that it refuses to analyze any further. Then, too, I remember that the day was one of exceeding beauty for that region; it was a swift alternation over head of those characteristic rain fogs, between the succession of which the sun breaks out with transcendent brilliancy through the misty halos about it; this parade field reflected the light like a mirror, and the seals, when they broke apart here and there for a moment, just enough to show its surface, seemed as though they walked upon the water. What a scene to put

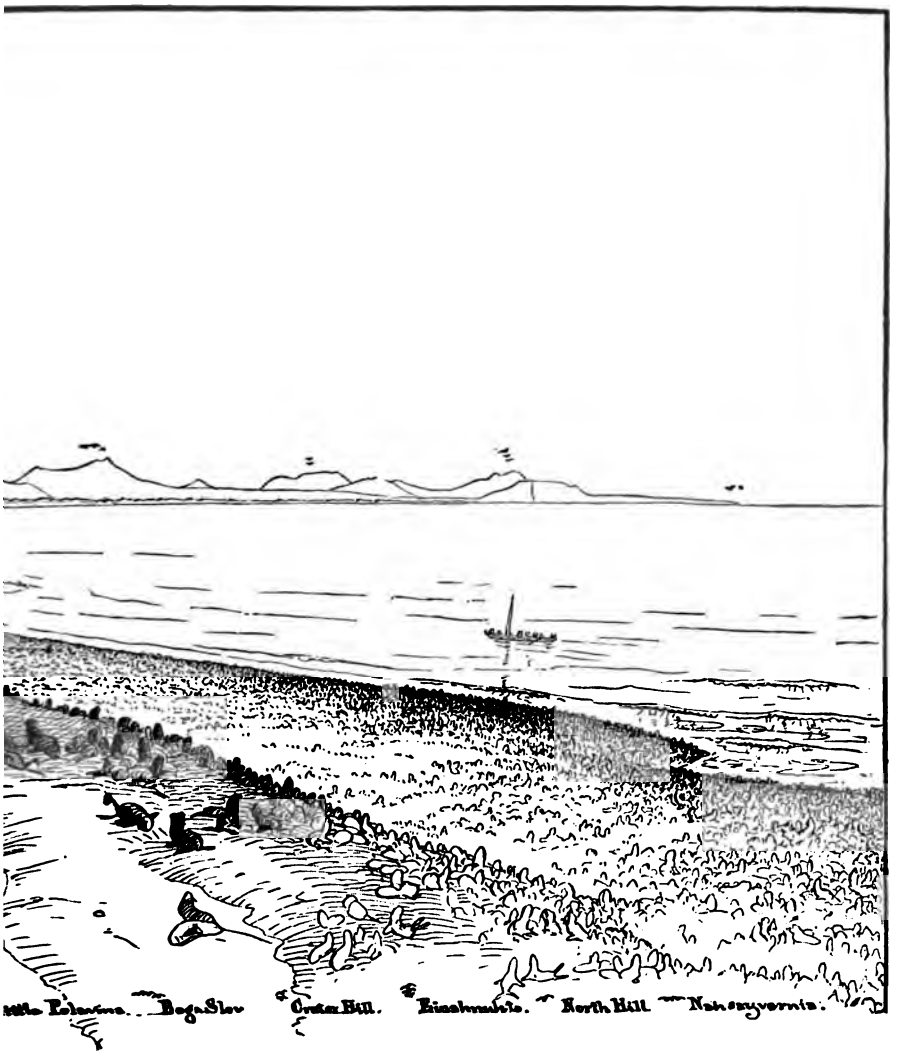
9

Plate IX.



THE NORTH SH

Viewed from the summit of Hutchinson's Hill, look



T. PAUL ISLAND.

V. over a portion of the Great Novastoshnah Rookery.

upon canvas—that amphibian host involved in those alternate rainbow lights and blue-gray shadows of the fog.

RECAPITULATION OF THE ESTIMATES OF NUMBER OF SEALS.—Below is a recapitulation of these figures, made from my surveys of the area and position of the breeding grounds of St. Paul Island, between the 10th and 18th of July, 1872, confirmed and revised to that date in 1874. It is the first survey ever made on the island of its rookeries:

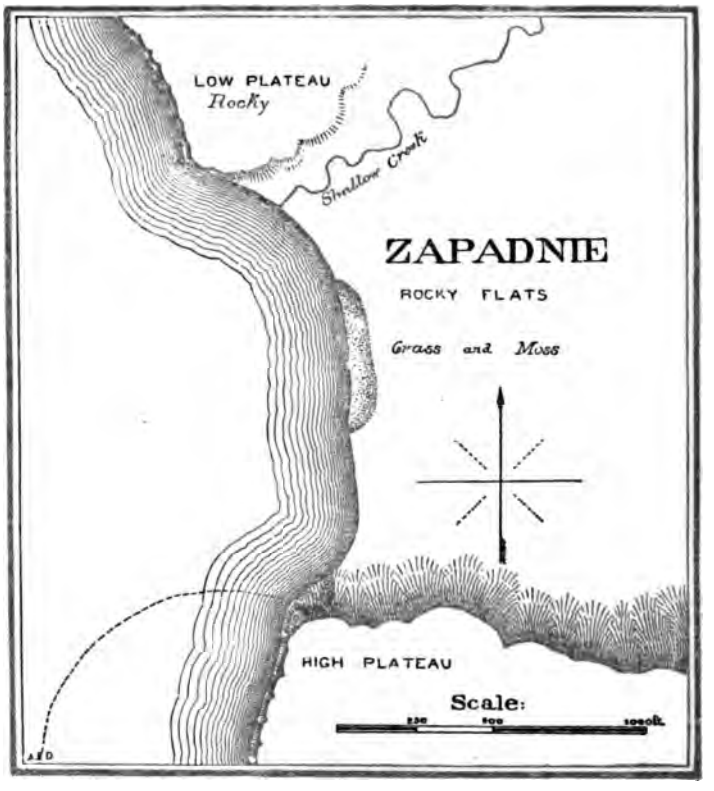
Breeding grounds of the fur seal on St. Paul Island.	Sea margin.	Average depth.	Seals—male, female, and young.
	Feet.	*Feet.*	
Reef rookery	4,016	150	301,000
Gorbotch rookery	3,660	100	183,000
Lagoon rookery	750	100	37,000
Nah Speel rookery	400	40	8,000
Lukannon rookery	2,270	150	170,000
Keetavie rookery	2,200	150	165,000
Tolstoi rookery	3,000	150	225,000
Zapadnie rookery	5,880	150	441,000
Polavina rookery	4,000	150	300,000
Novastoshnah, or Northeast Point	15,840	150	1,200,000
Total of breeding seals and young for St. Paul Island in 1874 of			3,090,000

ST. GEORGE.—St. George is now in order, and this island has only a trifling contribution for the grand total of the seal life; but small as it is, it is of much value and interest. Certainly Pribilof, not knowing of the existence of St. Paul, was as well satisfied as if he had possessed the boundless universe, when he first found it. As in the case of St. Paul Island, I have been unable to learn much here in regard to the early status of the rookeries, none of the natives having any real information. The drift of their sentiment goes to show that there never was a great assemblage of fur seals on St. George—in fact, never as many as there are to-day, insignificant as the exhibit is, compared with that of St. Paul. They say that at first the sea lions owned this island, and that the Russians, becoming cognizant of the fact, made a regular business of driving off the "seevitchie," in order that the fur seals might be encouraged to land. Touching this statement, with my experience on St. Paul, where there is no conflict at all between the 15,000 or 20,000 sea lions which breed around on the outer edge of the seal rookeries there and at Southwest point, I can not agree to the St. George legend. I am inclined to believe, however—indeed, it is more than probable—that there were a great many more sea lions on and about St. George before it was occupied by men, a hundredfold greater, perhaps, than now; because a sea lion is an exceedingly timid, cowardly creature when it is in the proximity of man, and will always desert any resting place where it is constantly brought into contact with him.[1]

[1] This statement of the natives has a strong circumstantial backing by the published account of Choris, a French gentleman of leisure and amateur naturalist and artist, who landed at St. George in 1820 (July). He passed several days off and on the land; he wrote at short length in regard to the sea lion, saying "that the shores were covered with innumerable troops of sea lions. The odor which arose from them was insupportable. These animals were all the time rutting," etc. Yet nowhere does he speak in the chapter or elsewhere in his volume of the fur seal on St. George, but incidentally remarks that over on St. Paul it is the chief animal and most abundant.—Voyage Pittoresque au tour du Monde, Iles Aléoutiennes, pp. 12, 13, Pl. XIV. 1822.

The scantiness of the St. George rookeries is due to the configuration of the island itself.[1] There are 5 separate, well-defined rookeries on St. George, as follows:

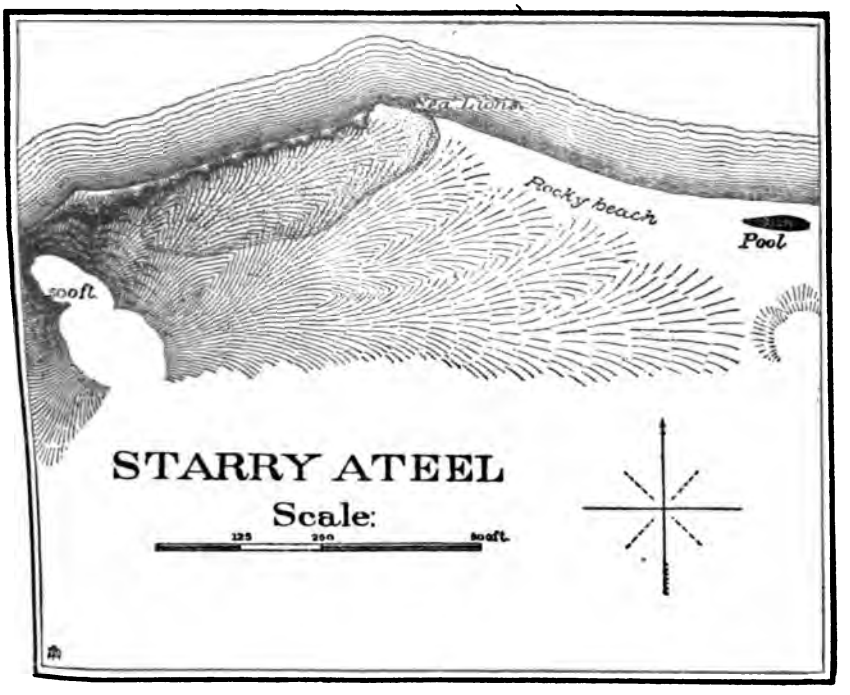
ZAPADNIE ROOKERY.—Directly across the island, from its north shore to Zapadnie Bay, a little over 3 miles from the village, is a point where the southern bluff walls of the island turn north and drop quickly down from their lofty elevation in a succession of heavy terraces to an expanse of rocky flat, bordered by a sea-sand beach. Just between the sand beach, however, and these terraces is a stretch of about 2,000 feet of low, rocky shingle, which borders the flat country back of it, and upon which the surf breaks free and boldly. Midway



between the two points is the rookery, and a small detachment of it rests on the direct sloping of the bluff itself, to the southward, while in and around the rookery, falling back to some distance, the "holluschickie" are found.

[1] Although this writing of Choris in regard to the subject is brief, superficial, and indefinite, yet I value the record he made, because it is prima facie evidence, to my mind, that had the fur seal been nearly as numerous on St. George then as it was on St. Paul he would have spoken of the fact surely, inasmuch as he was searching for just such items with which to illuminate his projected book of travels. The old Russian record as to the relative number of fur seals on the two islands of St. George and St. Paul is clearly as palpably erroneous for 1820 as I found it to be in 1872, 1873. No intelligent steps toward ascertaining that ratio were ever taken until I made my survey.

A great many confusing statements have been made to me about this rookery—more than in regard to any other on the islands. It has been said with much positiveness that in the times of the Russian rule this was an immense rookery for St. George, or, in other words, it covered the entire ground between that low plateau to the north and the high plateau to the south, as indicated on the map; and it is also cited in proof of this that the main village of the island for many years, thirty or forty, was placed on or near the limited drifting sand-dune tracts just above the plateau to the westward. Be the case as it may, it is certain that for a great, great many years back no such rookery has ever existed here. When seals have rested on a chosen piece of ground to breed, they wear off the sharp edges of fractured basaltic bowlders and polish the breccia and cement between them so



thoroughly and so finely that years and years of chiseling by frost and covering by lichens and creeping of mosses will be required to efface that record. Hence I was able, acting on the suggestion of the natives at St. Paul, to trace out those deserted fur-seal rookeries on the shores of that island. At Maroonitch, which had, according to their account, been abandoned for over sixty years by the seals, still, at their prompting, when I searched the shore, I found the old boundaries tolerably well defined. I could find nothing like them at Zapadnie.

Zapadnie rookery in July, 1873, had 600 feet of sea margin, with 60 feet of average depth, making ground for 18,000 breeding seals and their young. In 1874 I resurveyed the field and it seemed very clear to me that there had been a slight increase, perhaps to the number of 5,000, according to the expansion of the superficial area over that of 1873.

From Zapadnie we pass to the north shore, where all the other rookeries are located, with the village at a central point between them on the immediate border of the sea. And, in connection with this point, it is interesting to record the fact that every year, until recently, it has been the regular habit of the natives to drive the "holluschickie" over the 2½ or 3 miles of rough basaltic uplands which separate the hauling ground of Zapadnie from the village; driving them to the killing grounds there, in order to save the delay and trouble generally experienced in loading these skins in the open bay. The prevailing westerly and northwesterly winds during July and August make it, for weeks at a time, a marine impossibility to effect a landing at Zapadnie suitable for the safe transit of cargo to the steamer.

This 3 miles of the roughest of all rough walks that can be imagined is made by the fur seals in about seven or eight hours, when driven by the Aleuts and the weather is cool and foggy. I have known one Treasury agent, who, after making the trip from the village to Zapadnie, seated himself down in the barrabkie there, and declared that no money would induce him to walk back the same way that same day—so severe is the exercise to one not accustomed to it; but it exhibits the power of land locomotion possessed by the "holluschickie."[1]

STARRY ATEEL.[2] This rookery is the next in order, and it is the most remarkable one on St. George, lying as it does in a bold sweep from the sea, up a steeply inclined slope to a point where the bluffs bordering it seaward are over 400 feet high, the seals being just as closely crowded at the summit of this lofty breeding plat as they are at the water's edge. The whole oblong oval on the side hill, as designated by the accompanying survey, is covered by their thickly clustered forms. It is a strange sight also to sail under these bluffs with the boat in fair weather for a landing; and as you walk the beach, over which the cliff wall frowns a sheer 500 feet, there, directly over your head, the craning necks and twisting forms of the restless seals ever and anon, as you glance upward, appear as if ready to launch out and fall below, so closely and boldly do they press the very edge of the precipice.[3] There is a low, rocky beach to the eastward of this

[1] The peculiarly rough character to this trail is given by the large, loose, sharp-edged basaltic bowlders, which are strewn thickly over all those lower plateaus that bridge the island between the high bluffs at Starry Ateel and the slopes of Ahluckeyak Hill. The summits of the two broader, high plateaus, east and west respectively, are comparatively smooth and easy to travel over; and so is the sea level flat at Zapadnie itself. On the map of St. George a number of very small ponds will be noticed; they are the fresh-water reservoirs of the island. The two largest of these are near the summit of this rough divide. The seal trail from Zapadnie to the village runs just west of them, and comes out on the north shore, a little to the eastward of the hauling grounds of Starry Ateel, where it forks and unites with that path. The direct line between the village and Zapadnie, though nearly a mile shorter on the chart, is equal to 5 miles more of distance by reason of its superlative rocky inequalities.

[2] Starry Ateel, or Old Settlement, a few hundred yards to the eastward of the rookery, is the earthen ruins of one of the pioneer settlements in Pribilof's time, and which, the natives say, marks the first spot selected by the Russians for their village after the discovery of St. George, in 1786.

[3] I have been repeatedly astonished at the amazing power possessed by the fur seal of resistance to shocks which would certainly kill any other animal. To explain clearly, the reader will observe by reference to the maps that there are a great many cliffy places between the rookeries on the shore lines of the islands. Some of these cliffs are more than 100 feet in abrupt elevation above the surf and rocks awash below. Frequently "holluschickie," in ones, or twos, or threes, will stray far away back from the great masses of their kind and fall asleep in the

rookery, over which the "holluschickie" haul in proportionate numbers, and from which the natives make their drives, coming from the village for this purpose, and directing the seals back in their tracks.[1] Starry Ateel has 500 feet of sea and cliff margin, with 125 feet of average depth, making ground for 30,420 breeding seals and their young.

NORTH ROOKERY.—Next in order and half a mile to the eastward is this breeding ground, which sweeps for 2,750 feet along and around the sea front of a gently sloping plateau,[2] being in full sight of and close to the village. It has a superficial area occupied by 77,000 breeding seals and their young. From this rookery to the village, a distance of less than a quarter of a mile, the "holluschickie" are driven which are killed for their skins on the common track or seal-worn trail that not only the "bachelors" but ourselves travel over en route to and from Starry Ateel and Zapadnie. It is a broad, hard-

thick grass and herbage which covers these mural reaches. Sometimes they will lie down and rest very close to the edge, and then, as you come tramping along, you discover and startle them and yourself alike. They, blinded by their first transports of alarm, leap promptly over the brink, snorting, coughing, and spitting as they go. Curiously peering after them and looking down upon the rocks 50 to 100 feet below, instead of seeing their stunned and motionless bodies, you will invariably catch sight of them rapidly scrambling into the water, and, when in it, swimming off like arrows from the bow. Three "holluschickie" were thus inadvertently surprised by me on the edge of the west face to Otter Island. They plunged over from an elevation there not less than 200 feet in sheer elevation, and I distinctly saw them fall, in scrambling, whirling evolutions, down, thumping upon the rocky shingle beneath, from which they bounded as they struck like so many rubber balls. Two of them never moved after the rebound ceased, but the third one reached the water and swam away like a bird on the wing. While they seem to escape without bodily injury incident to such hard falls as ensue from dropping 50 or 60 feet upon pebbly beaches and rough bowlders below, and even greater elevations, yet I am inclined to think that some internal injuries are necessarily sustained in most every case, which soon develop and cause death. The excitement and the vitality of the seal at the moment of the terrific shock are able to sustain and conceal the real injury for the time being.

[1] Driving the "holluschickie" on St. George, owing to the relative scantiness of hauling area for those animals there and consequent small numbers found upon these grounds at any one time, is a very arduous series of daily exercises on the part of the natives who attend to it. Glancing at the map, the marked considerable distance, over an exceedingly rough road, will be noticed between Zapadnie and the village; yet in 1872 eleven different drives across the island of 400 to 500 seals each were made in the short four weeks of that season.

The following table shows plainly the striking inferiority of the seal life as to aggregate number on this island compared with that of St. Paul:

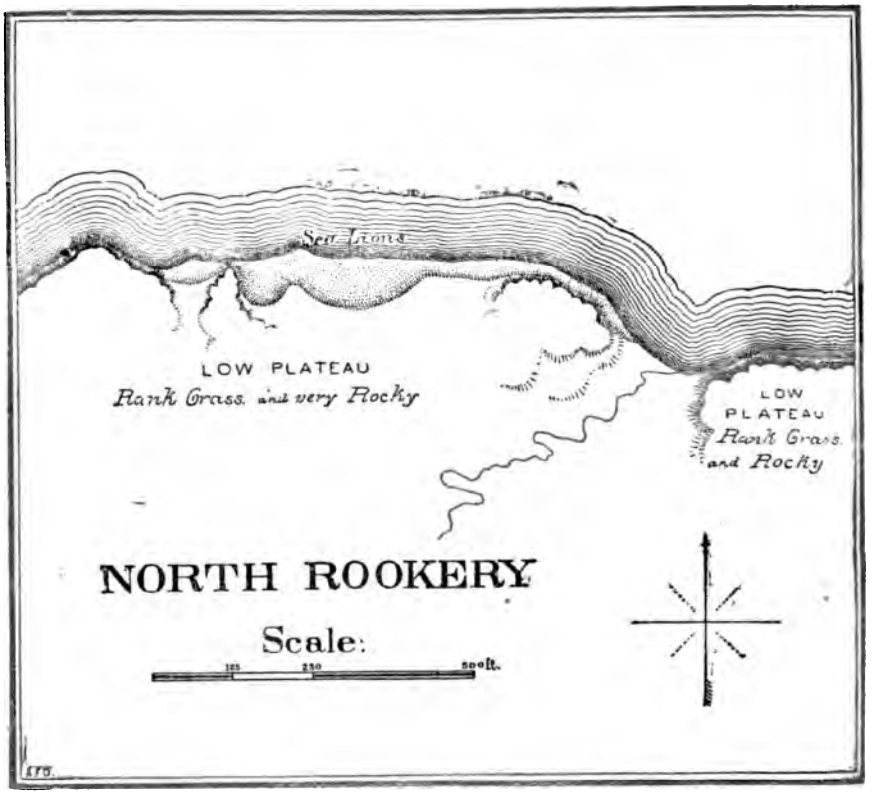
Rookeries of St. George.	Number of drives made in 1872.	Number of seals driven.
Zapadnie (between June 14 and July 28)	11	5,194
Starry Ateel (between June 6 and July 29)	14	5,274
North rookery (between June 1 and July 27)	16	4,818
Little Eastern		
Great Eastern (between June 5 and July 28)	16	9,714

The same activity in "sweeping" the hauling grounds of St. Paul would bring in ten times as many seals and the labor be vastly less. The driving at St. Paul is generally done with an eye to securing each day of the season only as many as can be well killed and skinned on that day, according as it be warmish or cooler.

[2] I should say "a gently sloping and alternating bluff plateau." Two thousand feet are directly under the abrupt faces of low cliffs, while the other 750 feet slope down gradually to the water's edge. These narrow cliff belts of breeding fur seals might be properly styled "rookery ribbons."

packed erosion through the sphagnum and across the rocky plateaux—in fact, a regular seal road, which has been used by the drivers and victims during the last eighty or ninety years. The fashion on St. George in this matter of driving seals is quite different from that on St. Paul. To get their maximum quota of 25,000 annually it is necessary for the natives to visit every morning the hauling grounds of each one of these four rookeries on the north shore and bring what they may find back with them for the day.

LITTLE EASTERN ROOKERY.[1]—From the village to the eastward, about half a mile again, is a little eastern rookery, which lies on a

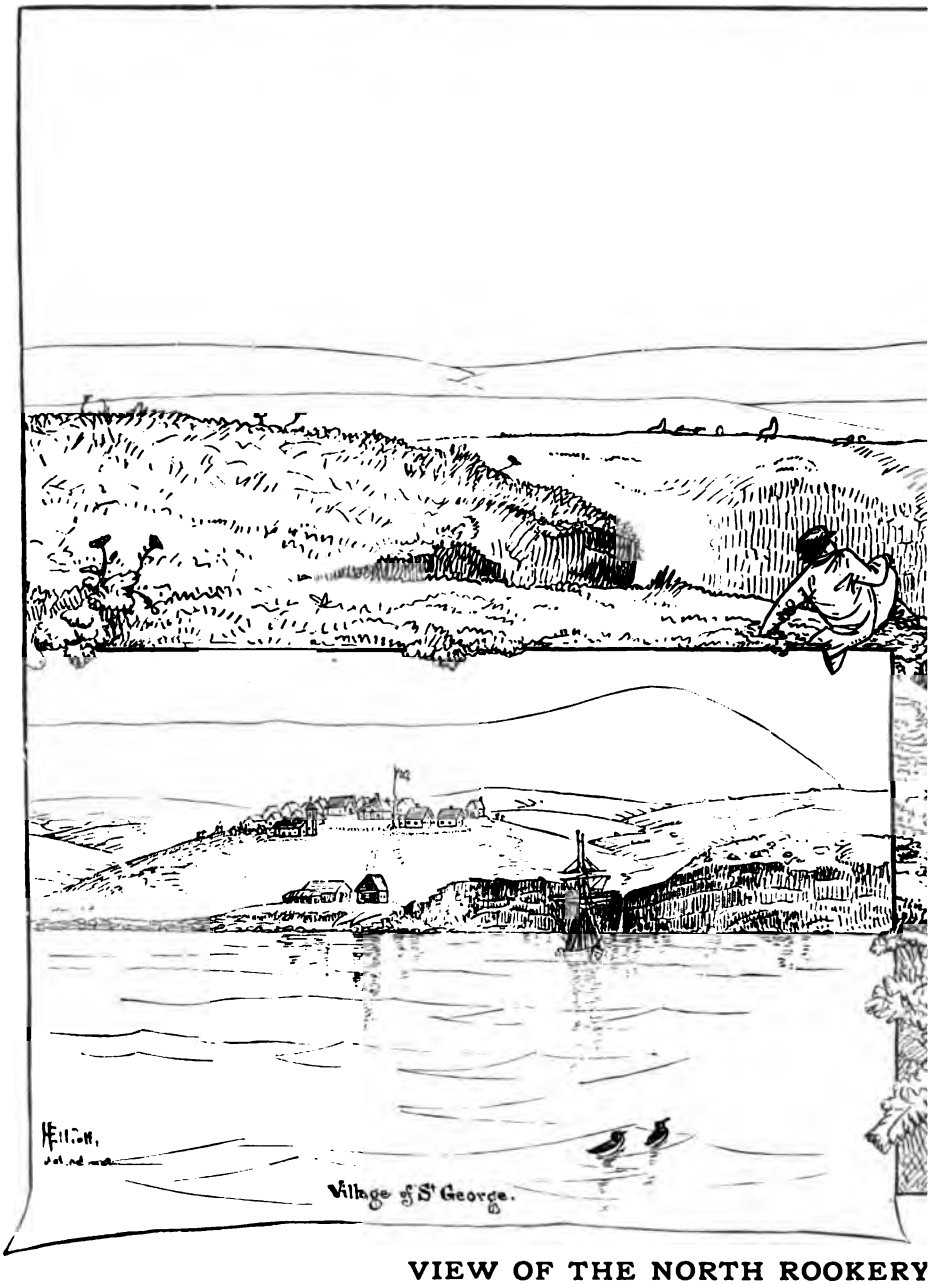


low bluffy slope and is not a piece of ground admitting of much more expansion. It has superficial area for the reception of nearly 13,000 breeding seals and their young.

THE GREAT EASTERN.—This is the last rookery that we find on St. George. It is an imitation, in miniature, of Tolstoi on St. Paul, with the exception of there being no parade ground in the rear of any character whatever. It is from the summit of the cliffs, overlooking the narrow ribbon of breeding seals right under them that I have

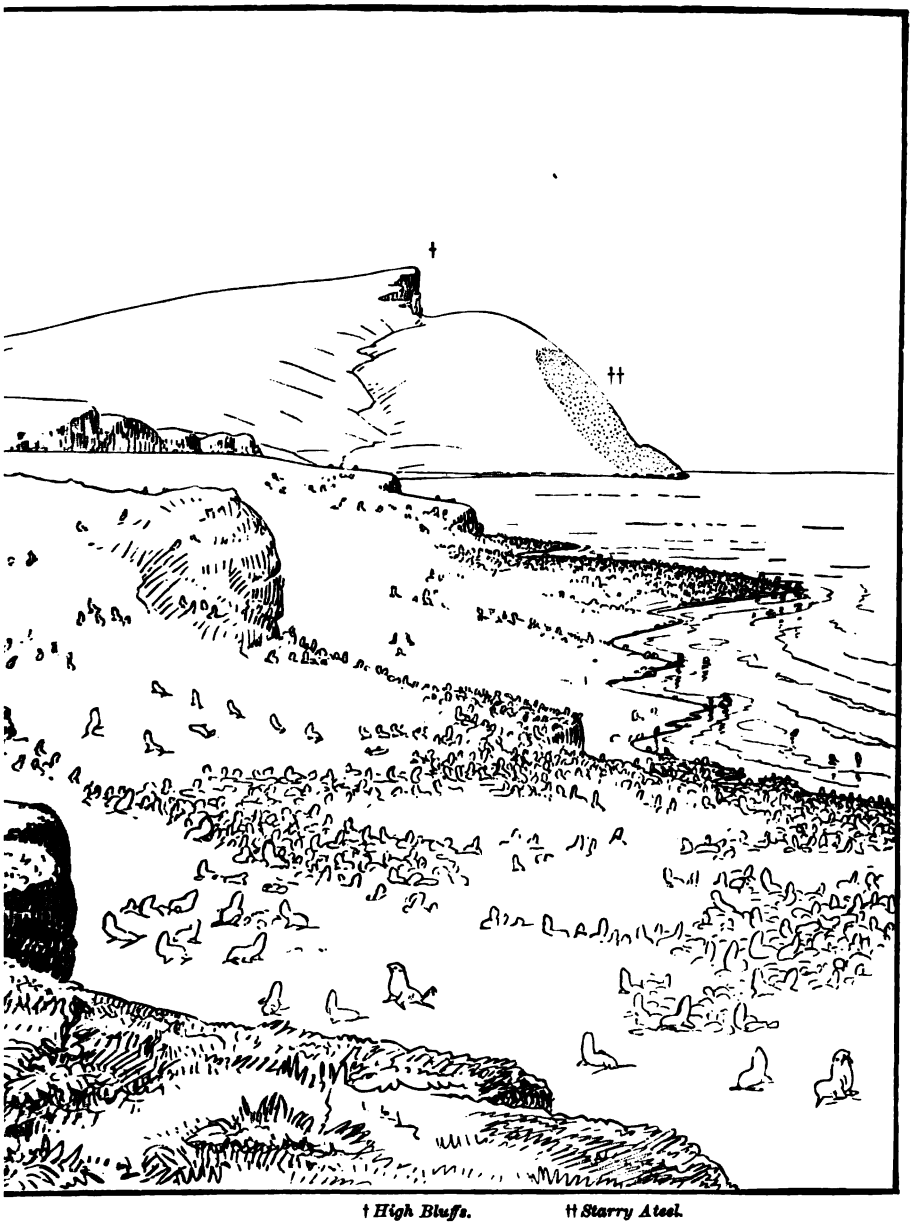
[1] The site of this breeding ground and that of the marine slope of the killing grounds to the east of the village on this island is where sea lions held exclusive possession prior to their driving off by the Russians—so the natives affirm. The only place on St. George now where the *Eumetopias* breeds is that one indicated on the general chart, between Garden Cove and Tolstoi Mees.

Plate X.



VIEW OF THE NORTH ROOKERY

St. George Isla

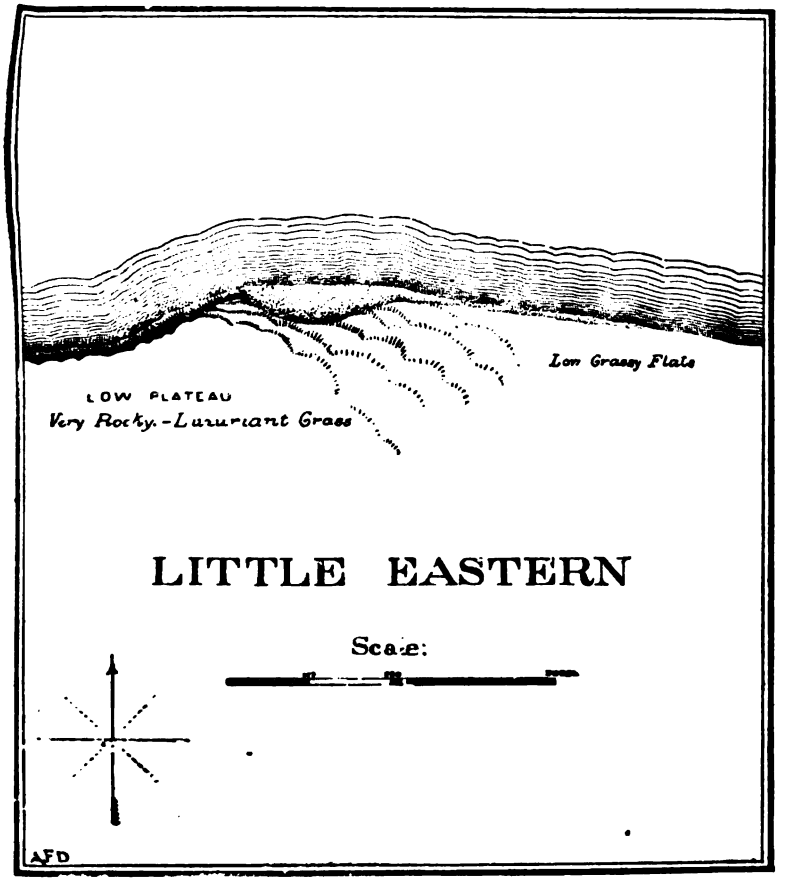


† *High Bluffs.* †† *Starry Ateel.*

ING WEST TO STARRY ATEEL.

ylov Group.

been able to study the movements of the fur seal in the water to my heart's content; for out and under the water the rocks, to a considerable distance, are covered with a whitish algoid growth that renders the dark bodies of the swimming seals and sea lions as conspicuous as is the image thrown by a magic lantern of a silhouette on a screen



prepared for its reception.[1] The low, rocky flats around the pool to

[1]The algoid vegetation of the marine shores of these islands is one that adds a peculiar charm and beauty to their treeless, sunless coasts. Every kelp bed that floats raft-like in Bering Sea or is anchored to its rocky reefs is fairly alive with minute sea shrimps, tiny crabs, and little shells, which cling to its masses of interwoven fronds or dart in ceaseless motion through, yet within, its interstices. It is my firm belief that no better base of operations can be found for studying marine invertebrata than is the post of St. Paul or St. George; the pelagic and the littoral forms are simply abundant beyond all estimation within bounds of reason. The phosphorescence of the waters of Bering Sea surpasses, in continued strength of brilliant illumination, anything that I have seen in southern and equatorial oceans. The crests of the long unbroken line of breakers on Lukannon Beach looked to me, one night in August, like an instantaneous flashing of lightning, between Tolsti Mees and Lukannon head, as the billows successively rolled in and broke. The seals swimming under the water here, on St. George and beneath the Black Bluffs, streaked their rapid course like comets in the sky, and every time their dark heads popped above the surface of the sea they were marked by a blaze of scintillant light.

the westward and northwest of the rookery seem to be filled up with a muddy alluvial wash that the seals do not favor; hence nothing but "holluschickie" range round about them.

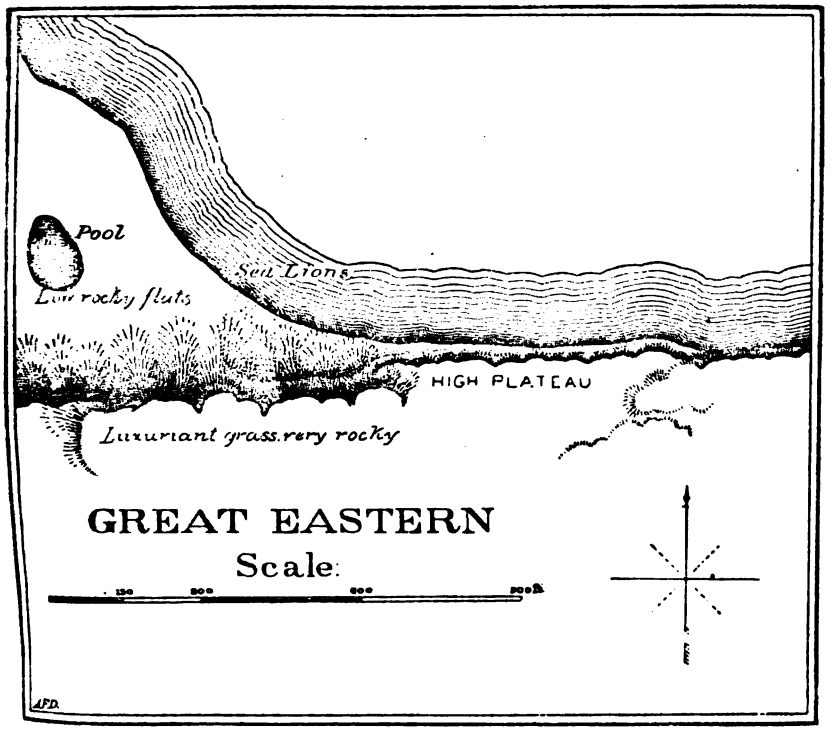
RECAPITULATION.—In recapitulation, therefore, the breeding grounds on St. George Island, according to the surveys which I made between the 12th and 15th of July, 1873, gave the following figures. They are also, as in the case of St. Paul, the first surveys ever made here:

Breeding grounds, July 12-15, 1873.	Sea margin.	Average depth.	Seals, male, female, and young.
	Feet.	*Feet.*	
Zapadnie rookery	600	60	18,000
Starry Ateel rookery	500	125	30,420
North rookery	750 2,000	150 25	77,000
Little Eastern rookery	750	40	13,000
Great Eastern rookery	900	60	25,000
Total seal life for St. George Island, breeding seals and young			163,420
Grand total for St. Paul Island, brought forward			3,030,000
Grand sum total for the Pribilof Islands (season of 1873)			3,193,420

The figures above thus show a grand total of 3,193,420 breeding seals and their young. This enormous aggregate is entirely exclusive of the great numbers of the nonbreeding seals that, as we have pointed out, are never permitted to come up on those grounds which have been surveyed and epitomized by the table just exhibited. That class of seals, the "holluschickie," in general terms all males, and those to which the killing is confined, come up on the land and sea beaches between the rookeries in immense, straggling droves, going to and from the sea at irregular intervals from the beginning to the closing of the entire season. The method of the "holluschickie" on these hauling grounds is not systematic—it is not distinct, like the manner and law prescribed and obeyed by the breeding seals, which fill up those rookery grounds to the certain points as surveyed, and keep these points intact for a week or ten days at a time during the height of every season in July and August; but, to the contrary, upon the hauling grounds to-day an immense drove of 100,000 will be seen before you at English Bay, sweeping hither and surging thither over the polished surface which they have worn with their restless flippers, tracing and retracing their tireless marches. Consequently the amount of ground occupied by the "holluschickie" is vastly in excess of what they would require did they conform to the same law of distribution observed by the breeding seals, and this ground is therefore wholly untenable for any such definite basis and satisfactory conclusion as is that which I have surveyed on the rookeries. Hence, in giving an estimate of the aggregate number of "holluschickie" or nonbreeding seals on the Pribilof Islands, embracing, as it does, all the males under 6 and 7 years of age and all the yearling females, it must necessarily be a simple opinion of mine, founded upon nothing better than my individual judgment. This is my conclusion:

The nonbreeding seals seem nearly equal in number to that of the adult breeding seals; but without putting them down at a figure quite so high, I may safely say that the sum total of 1,500,000, in round numbers, is a fair enumeration, and quite within bounds of fact. This makes the grand sum total of the fur-seal life on the Pribilof Islands over 4,700,000.

THE INCREASE OR DIMINUTION OF THE SEAL LIFE, PAST, PRESENT, AND PROSPECTIVE.—One stereotyped question has been addressed to me universally by my friends since my return, first in 1873, from the seal islands. The query is: "At the present rate of killing the seals, it will not be long ere they are exterminated; how much longer will they last?" My answer is now as it was then, "Provided matters are conducted on the seal islands in the future as they are to-day, 100,000 male seals under the age of 5 years and over 1, may be safely taken every year from the Pribilof Islands, without the slightest injury to the regular birth rates, or natural increase thereon; provided, also, that the fur seals are not visited by any plague, or pests, or any abnormal cause for their destruction, which might be beyond the con-



trol of men; and to which, like any other great body of animal life, they must ever be subjected to the danger of."[1]

[1]The thought of what a deadly epidemic would effect among these vast congregations of *Pinnepedia* was one that was constant in my mind when on the ground and among them. I have found in the British Annals (Fleming's), on page 17, an extract from the notes of Dr. Trail: "In 1833 I inquired for my old acquaintances, the seals of the Hole of Papa Westray, and was informed that about four years before they had totally deserted the island, and had only within the last few months begun to reappear. * * * About fifty years ago multitudes of their carcasses were cast ashore in every bay in the north of Scotland, Orkney, and Shetland, and numbers were found at sea in a sickly state." This note of Trail is the only record which I can find of a fatal epidemic among the seals. It is not reasonable to suppose that the Pribilof rookeries have never suffered from distempers in the past, or are not to in the future, simply because no occasion seems to have arisen during the comparatively brief period of their human domination.

LOSS OF LIFE SUSTAINED BY THE YOUNG SEALS.—From my calculations, given above, it will be seen that 1,000,000 pups, or young seals, in round numbers, are born upon these islands of the Pribilof group every year; of this million, one-half are males. These 500,000 young males, before they leave the islands for sea, during October and November, and when they are between 5 and 6 months old, fat and hardy, have suffered but a trifling loss in numbers, say 1 per cent, while on and about the islands of their birth, surrounding which, and upon which, they have no enemies whatever to speak of; but after they get well down to the Pacific, spread out over an immense area of watery highways in quest of piscatorial food, they form the most helpless of their kind to resist or elude the murderous teeth and carniverous attacks of basking sharks[1] and killer whales.[2] By these agencies, during their absence from the islands until their reappearance in the following year, and in July, they are so perceptibly diminished in number that I do not think, fairly considered, more than one-half of the legion which left the ground of their birth, last October, came up the next July to these favorite landing places; that is, only 250,000 of them return out of the 500,000 born last year. The same statement, in every respect, applies to the going and the coming of the 500,000 female pups, which are identical in size, shape, and behavior.

As yearlings, however, these 250,000 survivors of last year's birth have become strong, lithe, and active swimmers; and when they again leave the hauling grounds as before, in the fall, they are fully as able as are the older class to take care of themselves; and when they reappear next year at least 225,000 of them safely return in the second season after birth; from this on I believe that they live out their natural lives of fifteen to twenty years each; the death rate now caused by the visitation of marine enemies affecting them in the aggregate but slightly. And, again, the same will hold good touching the females, the average natural life of which, however, I take to be only nine or ten years each.

Out of these 225,000 young males we are required to save only one-fifteenth of their number to pass over to the breeding grounds and

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[1] *Somniosus microcephalus.* Some of these sharks are of very large size, and when caught by the Indians of the northwest coast, basking or asleep on the surface of the sea, they will, if transfixed by the natives' harpoons, take a whole fleet of canoes in tow and run swiftly with them several hours before exhaustion enables the savages to finally dispatch them. A Hudson Bay trader, William Manson (at Fort Alexander, in 1865), told me that his father had killed one in the smooth waters of Millbank Sound which measured 24 feet in length, and its liver alone yielded 36 gallons of oil. The *Somniosus* lies motionless for long intervals in calm waters of the North Pacific, just under and at the surface, with its dorsal fin clearly exposed above. What havoc such a carnivorous fish would be likely to effect in a pod of young fur seals can be better imagined than described.

[2] *Orca gladiator.* While revolving this particular line of inquiry in my mind when on the ground and among the seals, I involuntarily looked constantly for some sign of disturbance in the sea which would indicate the presence of an enemy; and, save seeing a few examples of the *Orca*, I never detected anything; If the killer whale were common here, it would be patent to the most casual eye, because it is the habit of this ferocious cetacean to swim so closely at the surface as to show its peculiar sharp dorsal fin high above the water. Possibly a very superficial observer could and would confound the long, trenchant fluke of the *Orca* with the stubby node upon the spine of the humpback whale, which that animal exhibits only when it is about to dive. Humpbacks feed around the islands, but not commonly—they are the exception. They do not, however, molest the seals in any manner whatever, and little squads of these pinnipeds seem to delight themselves by swimming in endless circles around and under the huge bodies of those whales, frequently leaping out and entirely over the cetacean's back, as witnessed on one occasion by myself and the crew of the *Reliance*, off the coast of Kadiak, June, 1874.

meet there the 225,000 young females; in other words, the polygamous habit of this animal is such that, by its own volition, I do not think that more than one male annually out of fifteen born is needed on the breeding grounds in the future; but in my calculations, to be within the margin and to make sure that I save 2-year-old males enough every season, I will more than double this proportion, and set aside every fifth one of the young males in question; that will leave 180,000 seals in good condition that can be safely killed every year without the slightest injury to the perpetuation of the stock itself forever in all its original integrity.[1]

In the above showing I have put the very extreme estimate upon the loss sustained at sea by the pup seals too large, I am morally certain; but in attempting to draw this line safely I wish to place the matter in the very worst light in which it can be put, and to give the seals the full benefit of every doubt. Surely I have clearly presented the case, and certainly no one will question the premises after they have studied the habit and disposition of the rookeries; hence, it is a positive and tenable statement that no danger of the slightest appreciable degree of injury to the interests of the Government on the seal islands of Alaska exists as long as the present law protecting it, and the management executing it, continues.

COURSE PURSUED BY THE SEALS AFTER LEAVING THE ISLANDS.—These fur seals of the Pribilof group, after leaving the islands in the autumn and early winter, do not visit land again until the time of their return in the following spring and early summer, to these same rookery and hauling grounds, unless they touch, as they are navigating their lengthened journey back, at the Russian Copper and Bering islands, 700 miles to the westward of the Pribilof group. They leave the islands by independent squads, each one looking out for itself. Apparently all turn by common consent to the south, disappearing toward the horizon, and are soon lost in the vast expanse below, where they spread themselves over the entire North Pacific as far south as the forty-eighth and even the forty-seventh parallels of north latitude. Over the immense area between Japan and Oregon, doubtless, many extensive submarine fishing shoals and banks are known to them. At least it is definitely understood that Bering Sea does not contain them long when they depart from the breeding rookeries and the hauling grounds therein. While it is carried in mind that they sleep and rest in the water with soundness and with the greatest comfort on its surface, and that even when around the land, during the summer, they frequently put off from the beaches to take a bath and a quiet snooze just beyond the surf, we can readily

[1] When regarding the subject in 1872–73 of how many surplus young males could be wisely taken from the Pribilof stock, I satisfied myself that more than 100,000 could be drawn upon annually for their skins, and hence was impressed with the idea that the business might be safely developed to a greater maximum; since then, however, I have been giving attention to the other side of the question, which involves the market for the skins and the practical working of any sliding scale of increased killing, such as I then recommended. A careful review of the whole matter modifies my original idea and causes me to think that, all things considered, it is better to "let well enough alone." Although it would be a most interesting commercial experiment to develop the yield of the Pribilof Islands to their full capacity, yet, in view of the anomalous and curious features of the case, it is wiser to be satisfied with the assured guaranty of perpetuation in all original integrity, which the experience of the last ten years gives us on the present basis of 100,000, than to risk it by possibly doubling the revenue therefrom. Therefore. I am not now in favor of my earlier proposition of gradually increasing the killing, until the maximum number of surplus "holluschickie" should be ascertained.

agree that it is no inconvenience whatever, when the reproductive functions have been discharged and their coats renewed, for them to stay the balance of the time in their most congenial element—the briny deep.

NATURAL ENEMIES OF THE FUR SEALS.—That these animals are preyed upon extensively by killer-whales (*Orca gladiator*), in especial, and by sharks, and probably other submarine foes now unknown, is at once evident; for, were they not held in check by some such cause, they would, as they exist to-day on St. Paul, quickly multiply, by arithmetical progression, to so great an extent that the island, nay, Bering Sea itself, could not contain them. The present annual killing of 100,000 out of a yearly total of over a million males does not, in an appreciable degree, diminish the seal life, or interfere in the slightest with its regular, sure perpetuation on the breeding grounds every year. We may, therefore, properly look upon this aggregate of four and five millions of fur seals, as we see them every season on these Pribilof Islands, as the maximum limit of increase assigned to them by natural law. The great equilibrium, which nature holds in life upon this earth, must be sustained at St. Paul as well as elsewhere.

FOOD CONSUMED BY THE FUR SEALS.—Think of the enormous food consumption of these rookeries and hauling grounds—what an immense quantity of finny prey must pass down their voracious throats as every year rolls by! A creature so full of life, strung with nerves, muscles like bands of steel, can not live on air or absorb it from the sea. Their food is fish, to the practical exclusion of all other diet. I have never seen them touch, or disturb with the intention of touching it, one solitary example in the flocks of waterfowl which rest upon the surface of the water all about the islands. I was especially careful in noting this, because it seemed to me that the canine armature of their mouths must suggest flesh for food at times as well as fish; but fish we know they eat. Whole windrows of the heads of cod and wolf fishes,[1] bitten off by these animals at the nape, were washed up on the south shore of St. George during a gale in the summer of 1873. This pelagic decapitation evidently marked the progress and the appetite of a band of fur seals to the windward of the island as they passed into and through a stray school of these fishes.

How many pounds per diem is required by an adult seal and taken by it when feeding is not certain in my mind. Judging from the appetite, however, of kindred animals, such as sea lions fed in confinement at Woodward's Gardens, San Francisco, I can safely say that 40 pounds for a full-grown fur seal is a fair allowance, with at least 10 or 12 pounds per diem to every adult female, and not much less, if any, to the rapidly growing pups and young "holluschickie." Therefore, this great body of four or five millions of hearty, active animals which we know on the seal islands must consume an enormous amount of such food every year. They can not average less than 10 pounds of fish each per diem, which gives the consumption, as exhibited by their appetite, of over 6,000,000 tons of fish every year. What wonder, then, that nature should do something to hold these active fishermen in check?[2]

PELAGIC RANGE OF FUR SEALS FOR FOOD.—During the winter solstice—between the lapse of the autumnal and the verging of the ver-

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[1] *Anarrhicas sp.*

[2] I feel confident that I have placed this average of fish eaten per diem by each seal at a starvation allowance, or, in other words, it is a certain minimum of the

nal equinoxes—in order to get this enormous food supply, the fur seals are necessarily obliged to disperse over a very large area of fishing ground, ranging throughout the North Pacific 5,000 miles across between Japan and the Straits of Fuca. In feeding they are brought to the southward all this time, and as they go they come more and more in contact with those natural enemies peculiar to the sea of these southern latitudes, which are almost strangers and are really unknown to the waters of Bering Sea; for I did not observe, with the exception of 10 or 12 perhaps, certainly no more, killer whales,[1] a single marine

whole consumption. If the seals can get double the quantity which I credit them with above, startling as it seems, still I firmly believe that they eat it every year. An adequate realization by icthyologists and fishermen as to what havoc the fur-seal hosts are annually making among the cod, herring, and salmon of the northwest coast and Alaska would disconcert and astonish them. Happily for the peace of political economists who may turn their attention to the settlement and growth of the Pacific Coast of America, it bids fair to never be known with anything like precision. The fishing of man, both aboriginal and civilized, in the past, present, and prospective, has never been, is not, nor will it be, more than a drop in the bucket contrasted with the piscatorial labors of these icthyophagi in those waters adjacent to their birth. What catholic knowledge of fish and fishing banks any-one of those old "see-catchie" must possess, which we observe hauled out on the Pribilof rookeries each summer. It has, undoubtedly, during the eighteen or twenty years of its life, explored every fish eddy, bank, or shoal throughout the whole of that vast immensity of the North Pacific and Bering Sea. It has had more piscine sport in a single twelvemonth than Izaak Walton had in his whole life.

An old sea captain, Dampier, cruising around the world just about two hundred years ago, wrote diligently thereof (or rather one Funnel is said to have written for him), and wrote well. He had frequent reference to meeting hair seals and sea lions, fur seals, etc., and fell into repeating this maxim, evidently of his own making: "For wherever there be plenty of fysh, there be seals." I am sure that, unless a vast abundance of good fishing ground was near by, no such congregation of seal life as is that under discussion on the seal islands could exist. The whole eastern half of Bering Sea, in its entirety, is a single fish-spawning bank, nowhere deeper than 50 to 75 fathoms, averaging, perhaps, 40; also, there are great reaches of fishing shoals up and down the northwest coast, from and above the Straits of Fuca, bordering the entire southern or Pacific coast of the Aleutian Islands. The aggregate of cod, herring, and salmon which the seals find upon these vast icthyological areas of reproduction must be simply enormous, and fully equal to the most extravagant demand of the voracious appetites of *Callorhini*.

When, however, the fish retire from spawning here, there, and everywhere over these shallows of Alaska and the northwest coast, along by the end of September to 1st of November every year, I believe that the young fur seal, in following them into the depths of the great Pacific, must have a really arduous struggle for existence—unless it knows of fishing banks unknown to us. The yearlings, however, and all above that age, are endowed with sufficient muscular energy to dive rapidly in deep soundings, and to fish with undoubted success. The pup, however, when it goes to sea, 5 or 6 months old, is not lithe and sinewy like the yearling; it is podgy and fat, a comparative clumsy swimmer, and does not develop, I believe, into a good fisherman until it has become pretty well starved after leaving the Pribilofs.

I must not be understood as saying that fish alone constitute the diet of the Pribilof pinnipeds; I know that they feed, to a limited extent, upon crustaceans and upon the squid (*Loligo*), also eating tender algoid sprouts; I believe that the pup seals live for the first five or six months at sea largely, if not wholly, upon crustaceans and squids; they are not agile enough, in my opinion, to fish successfully in any great degree when they first depart from the rookeries.

[1] But I did observe a very striking exhibition, however, of this character one afternoon while looking over Lukannon Bay. I saw a "killer" chasing the alert "hollnschickie" out beyond the breakers, when suddenly, in an instant, the cruel cetacean was turned toward the beach in hot pursuit, and in less time than this is read the ugly brute was high and dry upon the sands. The natives were called, and a great feast was in prospect when I left the carcass. But this was the only instance of the orca in pursuit of seals that came directly under my observation; hence, though it does undoubtedly capture a few here every year, yet it is an insignificant cause of destruction on account of its rarity.

disturbance, or molestation, during the three seasons which I passed upon the islands, that could be regarded in the slightest degree inimical to the peace and life of the *Pinnipedia;* and thus, from my observation, I am led to believe that it is not until they descend well to the south of the Aleutian Islands, and in the North Pacific, that they meet with sharks to any extent, and are diminished by the butchery of killer whales.[1]

The young fur seals going out to sea for the first time, and following in the wake of their elders, are the clumsy members of the family. When they go to sleep on the surface of the water, they rest much sounder than the others; and their alert and wary nature, which is handsomely developed ere they are two seasons old, is in its infancy. Hence, I believe that vast numbers of them are easily captured by marine foes, as they are stupidly sleeping or awkwardly fishing.

BEHAVIOR OF FUR SEALS IN THE WATERS AROUND THE ISLANDS.—In this connection I wish to record an impression very strongly made upon my mind in regard to their diverse behavior when out at sea, away from the islands, and when congregated thereon. As I have plainly exhibited in the foregoing chapter, they are practically without fear of man when he visits them on the land of their birth and recreation. But the same seal that noticed you with quiet indifference at St. Paul in June and July and the rest of the season while he was there, or gamboled around your boat when you rowed from the ship to shore, as a dog will play about your horses when you drive from the gate to the house, that same seal, when you meet him in one of the passes of the Aleutian chain, 100 or 200 miles away from here, as the case may be, or to the southward of that archipelago, is the shiest and wariest creature your ingenuity can define. Happy are you in getting but a single glimpse of him first; you will never see him after until he hauls out and winks and blinks across Lukannon sands.[2]

But the companionship and the exceeding number of the seals, when assembled together annually, makes them bold, largely due perhaps to their fine instinctive understanding, dating probably back many years, seeming to know that man, after all, is not wantonly destroying them, and what he takes he only takes from the ravenous maw of the killer

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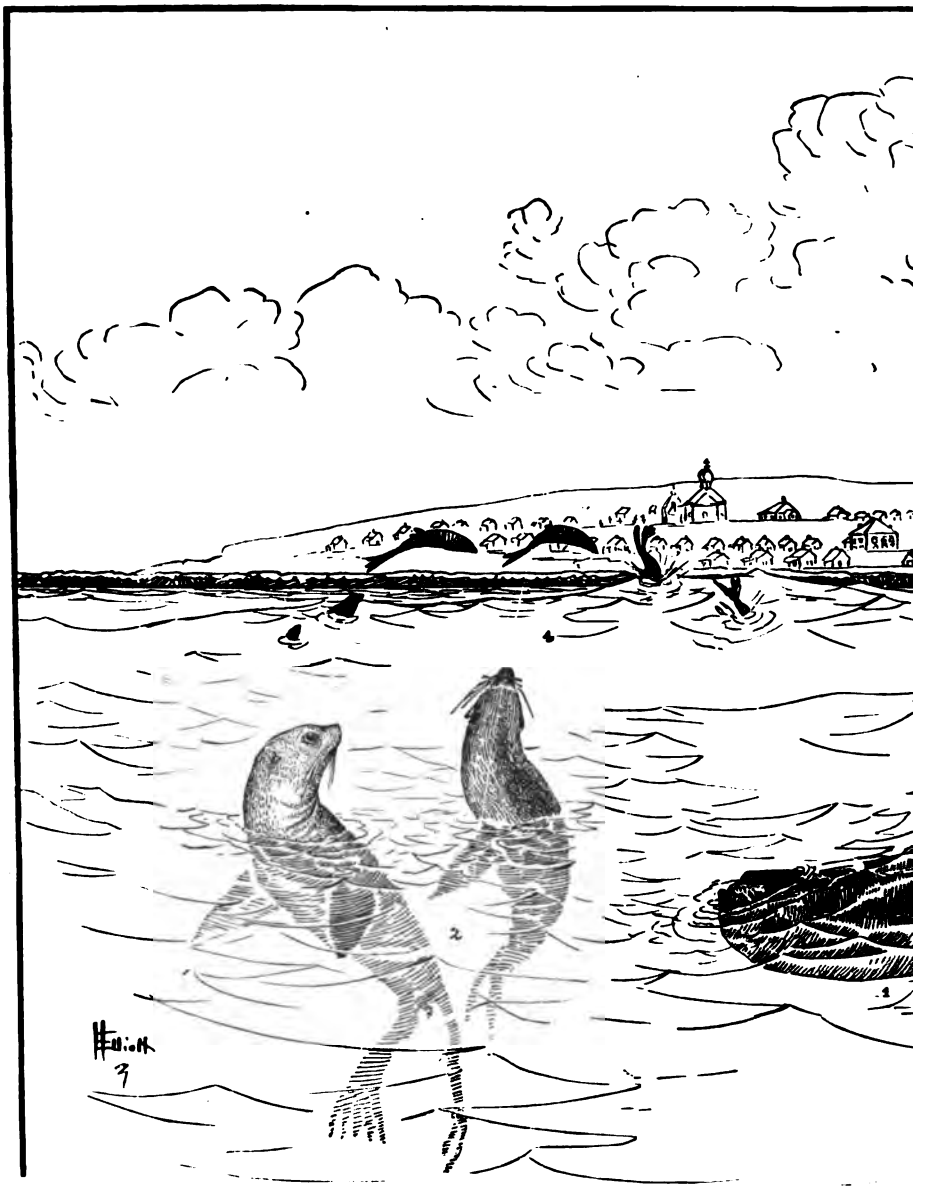
[1] In the stomach of one of these animals year before last 14 small harp seals were found.—Michael Carroll's Report of Seal and Herring Fisheries of Newfoundland.

[2] When fur seals were noticed by myself, far away from these islands at sea, I observed that then they were as shy and as wary as the most timorous animal which, in dreading man's proximity, could be—sinking instantly, on apprehending the approach or presence of the ship, seldom to reappear to my gaze. But when gathered in such immense numbers at the Pribilof Islands they are suddenly metamorphosed into creatures wholly indifferent to my person. It must cause a very curious sentiment in the mind of him who comes for the first time during the summer season to the island of St. Paul, where, when the landing boat or lighter carries him ashore from the vessel, the whole short marine journey is enlivened by the gambols and aquatic evolutions of fur-seal convoys to the "bidarrah," which sport joyously and fearlessly round and round his craft as she is rowed lustily ahead by the natives; the fur seals then of all classes, "holluschickie," principally, pop their dark heads up out of the sea, rising neck and shoulders erect above the surface, to peer and ogle at him and at his boat, diving quickly to reappear just ahead or right behind, hardly beyond striking distance from the oars. These gymnastics of *Callorhinus* are not wholly performed thus in silence, for it usually snorts and chuckles with hearty reiteration.

The sea lions up here also manifest much the same marine interest, and give the voyager an exhibition quite similar to the one which I have just spoken of, when a small boat is rowed in the neighborhood of its shore rookery; it is not, however, so bold, confident, and social as the fur seal under the circumstances,

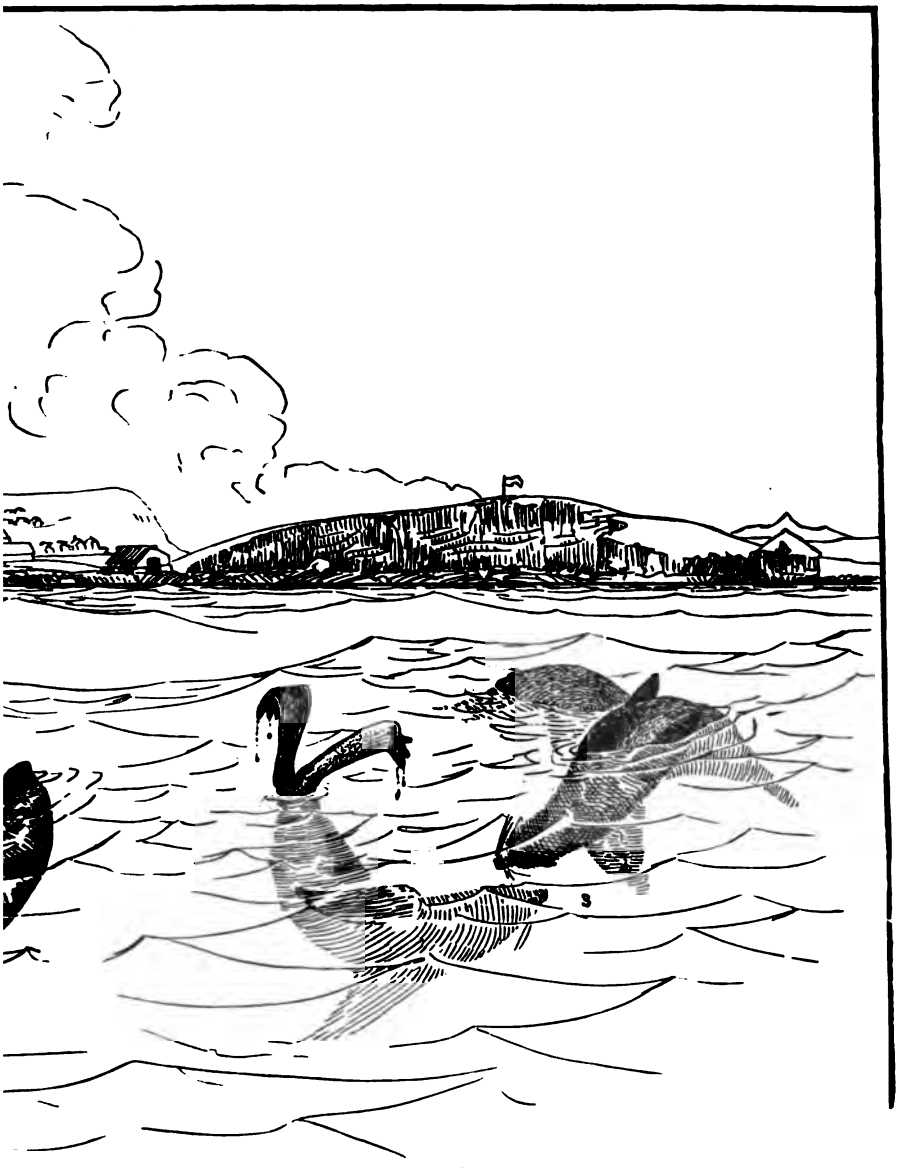
Plate XI.



PELAGIC ATTITUI

1. Position when sleeping. 2. Position in rising to breathe

The village of St. Paul in the distance, ar



THE FUR-SEAL.

, etc. 3. Positions in scratching, etc. 4. "Dolphin jumps."

Bluffs to the right on the middle ground.

whale or the saw-tipped teeth of the Japan shark. As they sleep in the water off the Straits of Fuca and the northwest coast as far as Dixon's Sound, the Indians belonging to that region surprise them with spears and rifle, capturing quite a number every year, chiefly pups and yearlings.

ENCYSTED BULLETS, ARROWS, ETC., IN FUR SEALS.—On the killing grounds at St. George, in June, 1873, the natives would frequently call my attention to seals that they were skinning, in the hides of which buckshot were embedded and encysted just under the skin in the blubber. From one animal I picked out fifteen shot, and the holes which they must have made in the skin were so entirely healed over as not to leave the faintest trace of a scar. These buckshot were undoubtedly received from the natives of the northwest coast, anywhere between the Straits of Fuca and the Aleutian Islands. The number taken by these hunters on the high seas is, however, inconsiderable; the annual average, perhaps, of 5,000 skins is a fair figure—some seasons more, some seasons less. The natives also have found on the killing grounds, in the manner just indicated, specimens of the implements employed by the Aleuts to the southward, such as tips of birds' spears and bone lances, comfortably encysted in the blubber under the skin; but only very small fragments are found, because I believe any larger pieces would create suppuration and slough out of the wounds.[1]

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and utters only a short, stifled growl of surprise, perhaps: its mobility, however, of vocalization is sadly deficient when compared with the scope and compass of its valuable relative's polyglottis.

The hair seals (*Phoca vitulina*) around these islands never approached our boats in this manner, and I seldom caught more than a furtive glimpse of their short, bulldog heads when traversing the coast by water.

The walrus (*Rosmarus obesus*) also, like *Phoca vitulina*, gave undoubted evidence of sore alarm over the presence of my boat and crew anywhere near its proximity in similar situations, only showing itself once or twice, perhaps at a safe distance, by elevating nothing but the extreme tip of its muzzle and its bleared, popping eyes above the water: it uttered no sound except a dull, muffled grunt, or else a choking, gurgling bellow.

[1]Touching this matter of the approximate numbers of fur seals which are annually slain in the open sea, straits, and estuaries of Bering Sea and the North Pacific Ocean, I have, necessarily, no definite data upon which to base a calculation; but such as I have points to the capture every year of 1,000 to 1,400 young fur seals in the waters of Unimak Pass, and as many in the straits adjoining Borka village, by the resident Aleuts. These are the only two points throughout the entire Aleutian chain and the peninsula where any *Callorhinus* is taken by the natives, except an odd example now and then elsewhere. On the northwest coast, between San Francisco and Prince William Sound, the fur seal is only apprehended to any extent at two points, viz, off the Straits of Fuca, 10 to 20 miles at sea, sweeping over a series of large fishing shoals which are located there, and in that reach of water between Queen Charlotte Island and the mouth of Dixon Sound. Several small schooners with native crews, and the Indians themselves in their own canoes, cruise for them here during May and June of each year. How many they secure every season is merely a matter of estimation and therefore not a subject of definite announcement. In my judgment, after carefully investigating the question at Victoria and Port Townsend in 1874, I believe as an average that these pelagic fur sealers do not altogether secure 5,000 animals annually. Those seals killed by the Aleuts of Makushin and Borka settlements, above referred to, are all pups and are used at home, none being exported for trade.

The last record which I can find of fur seals being taken on land other than that of the Pribilof group of the American side, is the following brief table of Techmainov, who, in 1863, published (in two volumes) a long recapitulation of the Russian-American Company's labors in Alaska, as illustrated by a voluminous series of personal letters by the several agents of that company. Techmainov

INCREASE OF THE SEAL LIFE.—I am free to say that it is not within the power of human management to promote this end to the slightest appreciable degree over its present extent and condition as it stands in the state of nature, heretofore described. It can not fail to be evident, from my detailed narration of the habits and life of the fur seal on these islands during so large a part of every year, that could man have the same supervision and control over this animal during the whole season which he has at his command while they visit the land he might cause them to multiply and increase, as he would so many cattle, to an indefinite number—only limited by time and the means of feeding them. But the case in question, unfortunately, is one where the fur seal is taken, by demands for food, at least six months out of every year, far beyond the reach or even cognizance of any man, where it is all this time exposed to many known powerful and destructive natural enemies, and probably many others, equally so, unknown, which prey upon it, and, in accordance with that well-recognized law of nature, keep this seal life at a certain number—at a figure which has been reached for ages past, and will continue to be in the future, as far as they now are—their present maximum limit of increase, namely, between four and five million seals, in round numbers. This law holds good everywhere throughout the animal kingdom, regulating and preserving the equilibrium of life in the state of nature. Did it not hold good, these seal islands and all Bering Sea would have been literally covered, and have swarmed, like the *Medusæ* of the waters, long before the Russians discovered them. But, according to the silent testimony of the rookeries, which have been abandoned by the seals, and the noisy, emphatic assurance of

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says that these fur seals were taken on the Farralones, which are small islets just abreast of the entrance to the Golden Gate, California.

Taken on the Farralones, California Coast.

	1824.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Fur seals	1,050	455	290	.....	210	287	.....	205	118	54	.....

This period of 1824–1834 was the one passed by the Russians in their occupation of Ross or Bodega, Cal., where a colony was engaged in raising cereals and beef for the stations in Alaska. I am inclined to think, however, that very likely many of the specimens of *Callorhinus* counted in this table were shot or speared, as they now are, out at sea off the Straits of Fuca. The number is insignificant, but the pelts were not very valuable in those days, and probably very slight exertions were made to get them, or otherwise 3,000 or 5,000 annually could have been secured at sea then, as they are to-day by our people and the Indians of Cape Flattery.

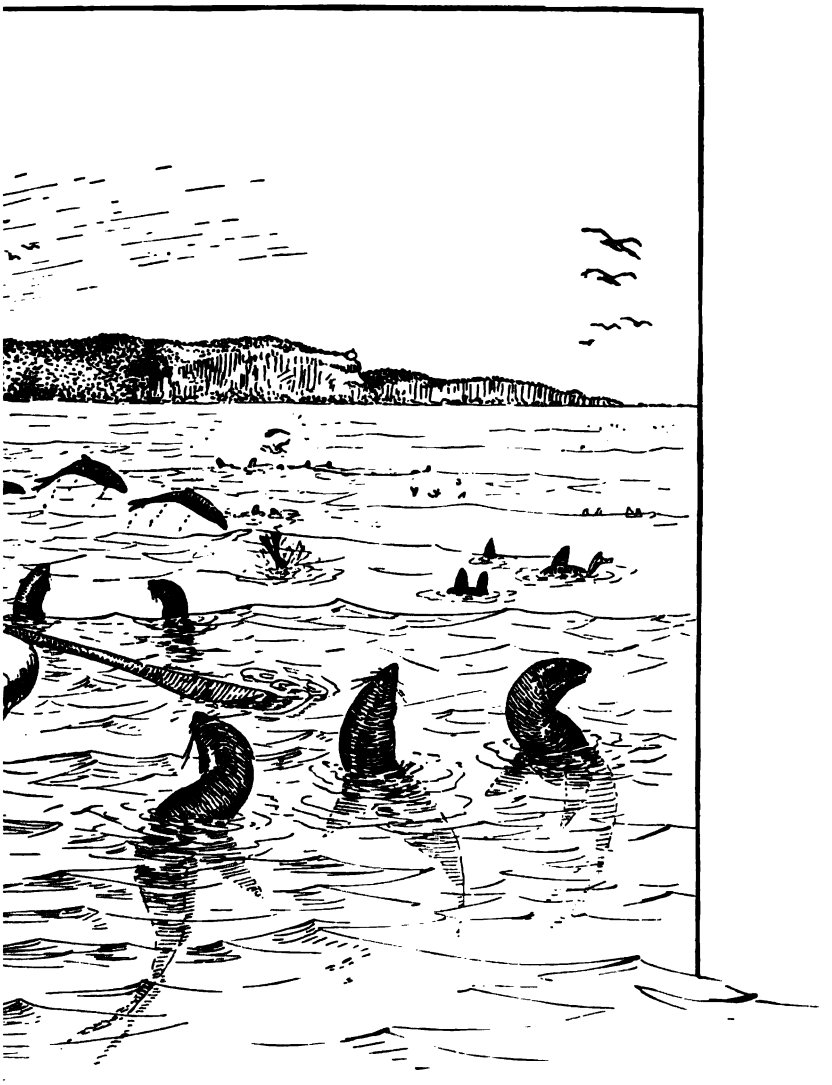
The record, however, of killing fur seals on the Farralones, between 1806 and 1837, by the Russians, who were established then at Bodega, Cal., is an honest one. I do not find any mention made of the fact that they bred there, and I am inclined to think they did not. I believe that when small squads of *Callorhinus ursinus* hauled out on the Californian islets they did so lured by the large numbers of breeding *Zalophus* and the *Eumetopias*, which repaired there then, as they do now, for that purpose. Had the sea lions not been there, in the manner aforesaid, the presence of fur seals on North American land, elsewhere than on that of the Pribilof group, would not have been thus determined and established. Again, in this connection and corroborative, is the fact that in 1878 a few hundred fur seals were taken by sea-lion hunters among the *Zalophus* at Santa Barbara and Guadaloupe islands, southern Californian coast. I am assured of this fact by the evidence of the gentleman who himself purchased the skins from the lucky hunters. None had ever been seen there before by our people, and none have been taken since. The Russian archives give no testimony on this score.

Plate XII.

FUR-SEALS SPORT

Natives of St. Paul lightering off the

View looking east over Zoltoi



THE BAIDAR.

ins to the ship from the Village Cove.

the great Reef Rookery.

those now occupied, there were no more seals when first seen here by human eyes in 1786 and 1787 than there are now, in 1881, as far as all evidence goes.

SITES OF ABANDONED ROOKERIES.—With reference to the amount of ground covered by the seals, when first discovered by the Russians, I have examined every foot of the shore line of both islands where the bones and polished rocks, etc., might be lying on any deserted areas. Since then, after carefully surveying the new ground now occupied by the seals, and comparing this area with that which they have deserted, I feel justified in stating that for the last twelve or fifteen years, at least, the fur seals on these islands have not diminished, nor have they increased as a body to any noteworthy degree; and throughout this time the breeding grounds have not been disturbed except at that brief but tumultuous interregnum during 1868; and they have been living since in a perfectly quiet and natural condition.

CAN THE NUMBER BE INCREASED?—What can be done to promote their increase? We can not cause a greater number of females to be born every year than are born now; we do not touch or disturb these females as they grow up and live; and we never will, if the law and present management is continued. We save double—we save more than enough males to serve; nothing more can be done by human agency; it is beyond our power to protect them from their deadly marine enemies as they wander into the boundless ocean searching for food.

In view, therefore, of all these facts, I have no hesitation in saying, quite confidently, that under the present rules and regulations governing the sealing interests on these islands, the increase or diminution of the seal life thereon will amount to nothing in the future; that the seals will exist, as they do exist, in all time to come at about the same number and condition recorded in this monograph. To test this theory of mine, I here, in the record of my surveys of the rookeries, have put stakes down which will answer, upon those breeding grounds, as a correct guide as to their present, as well as to their future, condition from year to year.

SURVEYING THE CONDITION OF THE ROOKERIES.—During the first week of inspection of some of those earliest arrivals, the "see-catchie," which I have described, will frequently take to the water when approached; but these runaways quickly return. By the end of May, however, the same seals will hardly move to the right or left when you attempt to pass through them. Then, two weeks before the females begin to come in, and quickly after their arrival, the organization of the fur-seal rookery is rendered entirely indifferent to man's presence on visits of quiet inspection, or to anything else, save their own kind, and so continues during the rest of the season.

INDIFFERENCE OF FUR SEALS TO CARRION SMELLS, BLOOD, ETC.—I have called attention to the singular fact that the breeding seals upon the rookeries and hauling grounds are not affected by the smell of blood or carrion arising from the killing fields, or the stench of blubber fires which burn in the native villages. This trait is conclusively illustrated by the attitude of those two rookeries near the village of St. Paul; for the breeding ground on this spit, at the head of the lagoon, is not more than 40 yards from the great killing grounds to the eastward, being separated from those spots of slaughter and the seventy or eighty thousand rotting carcasses thereon by a slough not more than 10 yards wide. These seals can smell the blood and carcasses upon this field from the time they land in the spring until they

leave in the autumn, while the general southerly winds waft to them the odor and sounds of the village of St. Paul, not over 200 rods south of them and above them, in plain sight. All this has no effect upon the seals—they know that they are not disturbed—and the rookery, the natives declare, has been slightly but steadily increasing. Therefore, with regard to surveying and taking those boundaries assumed by the breeding seals every year at that point of high tide and greatest expansion, which they assume between the 8th and 15th of July, it is an entirely practicable and simple task. You can go everywhere on the skirts of the rookeries almost within reaching distance, and they will greet you with quiet, inoffensive notice, and permit close, unbroken observation, when it is subdued and undemonstrative, paying very little attention to your approach.

YEARLY CHANGES IN THE ROOKERIES.—I believe the agents of the Government there are going to notice, every year, little changes here and there in the area and distribution of the rookeries. For instance, one of these breeding grounds will not be quite as large this year as it was last, while another one, opposite, will be found somewhat larger and expanded over the record which it made last season. In 1874 it was my pleasure and my profit to retraverse all these rookeries of St. George and St. Paul, with my field notes of 1872 in my hand, making careful comparisons of their relative size as recorded then and now. To show this peculiarity of enlarging a little here and diminishing a little there, so characteristic of the breeding grounds, I reproduce the following memoranda of 1874:

NORTHEAST POINT, *July 18, 1874.*

CONTRAST ON ST. PAUL BETWEEN 1872 AND 1874.—Quite a strip of ground near Webster's house has been deserted this season; but a small expansion is observed on Hutchinsons Hill. The rest of the ground is as mapped in 1872, with no noteworthy increase in any direction. The condition of the animals and their young, excellent; small irregularities in the massing of the families, due to the heavy rain this morning; sea lions about the same: none, however, on the west shore of the point.

The aggregate of life on this great rookery is, therefore, about the same as in 1872; the "holluschickie," or killable seals, hauling as well and as numerously as before. The proportions of the different ages among them of 2, 3, and 4 year olds, pretty well represented.

POLAVINA, *July 18, 1874.*

Stands as it did in 1872; breeding and hauling grounds in excellent condition; the latter, on Polavina, are changing from the uplands down upon Polavina sand beach, trending for 3 miles toward Northeast Point. The numbers of the "holluschickie" on this ground of Polavina, where they have not been disturbed for some 5 years, to mention, in the way of taking, do not seem to be any greater than they are on the hauling grounds adjacent to Northeast Point and the village, from which they are driven almost every day during the season of killing. I notice also this remarkable characteristic of the "holluschickie"—no matter how cleanly the natives may drive the seals off of a given piece of hauling ground this morning, if the weather is favorable, to-morrow will see it covered again just as thickly; and thus they drive in this manner from Zoltoi sands almost every day during the killing season, generally finding on the succeeding morning more, or as many, seals as they drove off the previous dawn. This seems to indicate that the "holluschickie" recognize no particular point as favored over another at the island when they land, which is evidently in obedience to a general desire of coming ashore at such a suitable place as promises no crowding and no fighting.

LUKANNON AND KETAVIE, *July 19, 1874.*

Not materially changed in any respect from its condition at this time in 1872.

GORBOTCH, *July 19, 1874.*

Just the same. Condition excellent.

REEF, *July 19, 1874.*

A slight contraction on the south sea margin of this ground; compensated for by fresh expansion under the bluffs on the northwest side; not noteworthy in either instance. Condition excellent.

NAH SPEEL, *July 20, 1874.*

A diminution of one-half at least. Very few here this year. It is no place for a rookery: not a pistol shot from the natives' houses, and all the natives' children fooling over the bluffs.

LAGOON, *July 20, 1874.*

No noteworthy change; if any, a trifling increase. Condition good. Animals clean and lively.

TOLSTOI, *July 21, 1874.*

No perceptible change in this rookery from its good shape of 1872. The condition excellent.

ZAPADNIE, *July 22, 1874.*

A remarkable extension or increase I note here, of 2,000 feet of shore line, with an average depth of 50 feet of breeding ground, which has been built on to Upper Zapadnie, stretching out toward Tolstoi; the upper rookery proper has not altered its bearings or proportions; the sand beach belt between it and Lower Zapadnie is not occupied by breeding seals; and a fair track for the "holluschickie," 500 feet wide, left clear, over which they have traveled quite extensively this season, some 20,000 to 25,000 of them, at least, lying out around the old salt house to-day. Lower Zapadnie has lost in a noteworthy degree about an average of 20 feet of its general depth, which, however, is more than compensated for by the swarming on the upper rookery. A small beginning had been made for a rookery on the shore just southwest from Zapadnie Lake, in 1872, but this year it has been substantially abandoned.

CONTRAST ON ST. GEORGE BETWEEN 1873 AND 1874.—An epitome of my notes for St. George gives, as to this season of 1874, the following data for comparison with that of 1873:

ZAPADNIE, *July 8, 1874.*

This rookery shows a slight increase upon the figures of last year, about 5,000. Fine condition.

STARRY ATEEL, *July 6, 1874.*

No noteworthy change from last year.

NORTH ROOKERY, *July 6, 1874.*

No essential change from last year. Condition very good.

LITTLE EASTERN, *July 6, 1874.*

A slight diminution of some 2,000 or so. Condition excellent.

EASTERN ROOKERY, *July 7, 1874.*

A small increase over last year of about 3,000, only trifling, however; the aggregate seal life here similar to that of tast season, with the certainty of at least a small increase. The unusually early season this year brought the rookery "seecatchie" on the ground very much in advance of the general time; they landed as early as the 10th of April, while the arrival of the cows was as late as usual, corresponding to my observations during the past seasons.

The general condition of the animals of all classes on St. George is most excellent—they are sleek, fat, and free from any disease.

In this way it is plain that practically the exact condition of these animals can be noted every season; and should a diminution be observed, due to any cause, known or unknown, the killing can be promptly regulated or stopped to any required quota.

Ten years have passed with the end of last season in which nearly 100,000 young males have been annually taken on St. Paul and St. George—75,000 from the former and 25,000 from the latter, as a rule—and we now have the experience with which to enlighten our under-

standing and to make our statement correct. That affirmation is, that if the effect of annually killing 100,000 young male seals is either to increase or to diminish the seal life on the Pribilof Islands, it can not be noticed; it has not, to a certainty, wrought injury, and it has not promoted an increase. I advanced this hypothesis in 1873, and I now find it completely verified and confirmed by the united intelligent testimony of those who have followed on the ground in my footsteps.

PECUNIARY VALUE OF THE SEAL LIFE ON THE PRIBILOF ISLANDS.—The theoretical value of these interests of the Government on the Pribilof Islands, represented by 2,500,000 to 3,000,000 fur seals, male and female, in good condition, is not less than $10,000,000 or $12,000,000; taking, however, the females out of the question and from this calculation, and looking at the "holluschickie" alone, as they really represent the only killable seals, then the commercial value of the same would be expressed by the sum of $1,800,000 to $2,000,000. This is a permanent principal invested here, which now nets the public treasury more than 15 per cent annually; a very handsome rate of interest, surely.

STRANGE IGNORANCE OF THEIR VALUE IN 1867.—Considering that this return is the only one made to the Government by Alaska since its transfer, and that it was never taken into account at first by the most ardent advocates of the purchase of Russian America, it is in itself highly creditable and interesting. To Senator Sumner the friends of the acquisition of this territory in 1867 delegated the task of making the principal argument in its favor. Everything that was written in strange tongues was carefully translated for the choice bits of mention which could be found of Alaska's value. Hence his speech[1] on the subject possesses this interest: It is the embodiment of everything that could be scraped together, having the faintest shadow of authenticity, by all of the eager friends of the purchase, which gave the least idea of any valuable natural resources in Alaska. Therefore, when in summing all this up he makes no reference whatever to the seal islands or the fur seal itself, the extraordinary ignorance at home and abroad relative to the Pribilof Islands can be well appreciated.

THOUGHTS UPON THE POSSIBLE MOVEMENTS OF THE FUR SEALS IN THE FUTURE.—As these animals live and breed upon the Pribilof Islands, the foregoing studies of their habits declare certain natural conditions of landing ground and climate to be necessary for their existence and perpetuation. From my surveys made upon the islands to the north, St. Matthew and St. Lawrence, together with the scientific and corroborating testimony of those who have visited all of the mainland coast of Alaska and the islands contiguous, including the peninsula and the great Aleutian archipelago, I have no hesitation in stating that the fur seal can not breed, or rest, for that matter, on any other land than that now resorted to, which lies within our boundary lines. The natural obstacles are insuperable. Therefore, so far as our possessions extend, we have, in the Pribilof group, the only eligible land to which the fur seal can repair for breeding, and on which, at St. Paul Island alone, there is still room enough of unoccupied rookery ground for the accommodation of twice as many seals as we find there to-day. But we must not forget a very important prospect; for we know that to the westward only 700 miles, and within the jurisdic-

[1] Speech on cession of Russian America, United States Senate, 1867; *Summary*, p. 48.

tion of Russia, are two other seal islands—one very large, on which the fur seal regularly breeds also; and though from the meager testimony in my possession, compared with St. Paul, the fur seal life upon them is small, still, if that land within the pale of the Czar's dominion be as suitable for the reception of the rookeries as is that of St. Paul, then what guarantee have we that the seal life on Copper and Bering islands, at some future time, may not be greatly augmented by a corresponding diminution of our own, with no other than natural causes operating? Certainly, if the ground on either Bering or Copper Island, in the Commander group, is as well suited for the wants of the breeding fur seal as is that exhibited by the Pribilof Islands, then I say confidently that we may at any time note a diminution here and find a corresponding augmentation there; for I have clearly shown, in my chapter on the habits of these animals, that they are not so particularly attached to the respective places of their birth, but that they rather land with an instinctive appreciation of the fitness of that ground as a whole.

NEED OF MORE DEFINITE KNOWLEDGE CONCERNING THE RUSSIAN SEAL ISLANDS.—If we, however, possess all the best suited ground, then we can count upon retaining the seal life as we now have it, by a vast majority, and in no other way; for it is not unlikely that some season may occur when an immense number of the fur seals, which have lived during the last four or five years on the Pribilof Islands, should be deflected from their usual feeding range at sea by the shifting of schools of fish and other abnormal causes, which would bring them around quite close to the Asiatic seal grounds in the spring; and the scent from those rookeries would act as a powerful stimulant and attraction for them to land there, where the conditions for their breeding may be just as favorable as they desire. Such being the case, this diminution, therefore, which we would notice on the Pribilof group, might be the great increase observed at the Commander Islands, and not due to any mismanagement on the part of the men in charge of these interests. Thus, it appears to me necessary that definite knowledge concerning the Commander Islands and the Kuriles should be gathered.

If we find, however, that the character of this Russian seal land is restricted to narrow beach margins, under bluffs, as at St. George, then we shall know that a great body of seals will never attempt to land there when they could not do so without suffering, and in violation of their laws, during the breeding season. Therefore, with this correct understanding to start on, we can then feel alarmed with good reason should we ever observe any diminution, to a noteworty degree, on our sea islands of Bering Sea.

POSSIBLE DEFLECTION OF SEALS IN FEEDING.—I do not call attention to this subject with the slightest idea in my mind, as I write, of any such contingency arising, even for an indefinite time to come; but still I am sensible of the fact that it is possible for it to occur any season. But the seals undoubtedly feed on their pelagic fields in systematic routine of travel from the time they leave the Pribilof Islands until that of their return. Therefore, in all probability, unless the fish upon which they are nourished suddenly become scarce in our waters and soundings, the seals will not change their base, as matters now progress; but it is possible for the finny shoals and schools to be so deflected from their migration to and from their spawning beds as to carry this seal life with it, as I have hinted above. Thus it can not

be superfluous to call up this question, so that it shall be prominent in discussion and suggestion for future thought.

NEED OF CAREFUL YEARLY EXAMINATION.—In the meantime the movements of the seals upon the great breeding rookeries of St. Paul and those of St. George should be faithfully noted and recorded every year; and as time goes on this record will place the topic of their increase or diminution beyond all theory or cavil.

MANNER OF TAKING THE SEALS.

EXHIBIT OF ALL SKINS SHIPPED FROM THE PRIBILOF ISLANDS.—As an exhibit of the entire number of fur-seal skins taken for taxes and sale from the Pribilof Islands between 1797 and 1880, inclusive, I present the following table, which, although it may vary from the true aggregate during the long period of nearly one hundred years covered by it, I am nevertheless satisfied it is the best evidence of the kind which can be obtained. Prior to the year 1868 it will be noticed that I have given only a series of estimates for the period antedating that year, as far back as 1862. The reason for this is that I can find nowhere, in writing, an authenticated record of the catch. It was the policy of the old Russian company invariably to take more skins, every year, from these islands down to Sitka than they could profitably dispose of annually in the markets of the world; a large surplus being yearly left over, which were suffered to decay or be destroyed my moths and subsequently thrown into the sea. I can only judge, therefore, of what they took in that period from what I know they had on hand in their salt house at St. George and St. Paul during 1867, which was 40,000 to 48,000 skins; and this the natives told me was a larger average than they had taken for a great many years prior to that date. Hence, I have proportioned it back to the last record, which I find in Techmainov, whose figures, embraced in the three periods, from 1796 to 1861, have been given as copied by him from the authentic archives of the old Russian company. He is careful to say, in this connection, that the exhibit does not show all skins that were taken from the seal islands, but only those which the Russians took for sale from Sitka.

And, again, other Russian authors, rather than this historian of the Russian American Company, have said that immense numbers of fur-seal skins—hundreds of thousands—were frequently accumulated in the warehouses at Sitka only to decay and be destroyed. Their aggregate can not be estimated within any bound of accuracy, and it is not in the sum total of the following table. What we have taken on the island since 1868 is presented below, almost correct. In the appendix, where I give a short digest of Professor Nordenskiöld's visit to Bering Island, will be found another table showing the number of skins taken from those Russian Commander Islands. In the following table, relative to the Pribilof group, it will be noticed that there is a gap of ten years, between 1786, the date of their discovery, and 1805, the time of the earliest Russian record. How many were taken then there is not the faintest evidence in black and white; but we do know that from the time of the discovery of the Pribilof Islands up to 1799 the taking of fur seals on both of these islands progressed without count or lists, and without any responsible head or director, because there were then, upon those islands, seven or eight different

companies, represented by as many agents or leaders, and all of them vied one with the other in taking as many fur seals as they could:[1]

Fur-seal skins taken from the Pribilof Islands for shipment and sale.

Period.	Number of skins.	Period.	Number of skins.	Period.	Number of skins.
1797-1821 (24 years)*a*	1,232,374	1867	?48,000	1875	99,500
1821-1842 (21 years)*a*	458,502	1868	242,000	1876	99,000
1842-1861 (19 years)*a*	372,000	1869	87,000	1877	83,500
1862	?20,000	1870	9,965	1878	95,000
1863	?25,000	1871	63,000	1879	99,968
1864	?26,000	1872	99,000	1880	99,950
1865	?40,000	1873	99,630		
1866	?42,000	1874	99,820	Total	3,561,051

a Including about 5,000 annually from the Commander Islands.

THE MANNER IN WHICH THE SEALS ARE TAKEN.—By reference to the habit of the fur seal, which I have discussed at length, it is now plain and beyond doubt that two-thirds of all the males which are born—and they are equal in numbers to the females born—are never permitted by the remaining third—strongest by natural selection—to land upon the same breeding ground with the females, which always herd thereupon en masse. Hence this great band of "bachelor" seals, or "holluschickie," so fitly termed, when it visits the island is obliged to live apart entirely, sometimes and some places miles away from the rookeries; and in this admirably perfect method of nature are those seals which can be properly killed without injury to the rookeries selected and held aside by their own volition, so that the natives can visit and take them without disturbing in the least degree the entire quiet of the breeding grounds where the stock is perpetuated.

The manner in which the natives capture and drive the "holluschickie" up from the hauling grounds to the slaughter fields near the two villages of St. Paul and St. George and elsewhere on the islands can not be improved upon. It is in this way: At the beginning of every sealing season—that is, during May and June—large bodies of the young "bachelor" seals do not haul up on land very far from the water—a few rods at the most—and when these first arrivals are sought after the natives in capturing them are obliged to approach slyly and run quickly between the dozing seals and the surf before they can take alarm and bolt into the sea. In this manner a dozen Aleuts running down the sand beach of English Bay in the early morning of some June day will turn back from the water thousands of seals, just as the mold board of a plow lays over and back a furrow of earth. When the sleeping seals are first startled they arise and seeing men between them and the water immediately turn, lope, and scramble rapidly back

[1] The attempt on my part to get an authentic list of the numbers of fur seals slain upon the Pribilof Islands prior to 1868 has simply been, to my mind, a partial failure. My investigation and search for such record has satisfied me that it does not exist. Memoranda of shipments only, each season, were made by the agents of the Russian company when the vessels took those skins from the seal islands to Sitka, and of these skins again count was only made of such as were exported to China or Russia, no mention being made anywhere of the number which was consumed in Alaska by the company's large force of attachés, or else destroyed at New Archangel. This method of accounting for the yield from the Pribilofs from 1806 or 1817 up to 1867 naturally confuses a correct determination as to the sum total—renders it, perhaps, very inaccurate. This explanation is, at least, due to the reader.

up and over the land. The natives then leisurely walk on the flanks and in the rear of the drove thus secured, directing and driving it over to the killing grounds, close by the village.[1]

PROGRESSION OF A SEAL DRIVE.—A drove of seals on hard or firm grassy ground, in cool and moist weather, may be driven with safety at the rate of half a mile an hour. They can be urged along, with the expenditure of a great many lives, however, at the speed of a mile or a mile and a quarter per hour; but this is seldom done. An old bull seal, fat and unwieldy, can not travel with the younger ones, though it can lope or gallop as it starts across the ground as fast as an ordinary man can run over 100 yards; but then it fails utterly, falls to the earth supine, entirely exhausted, hot, and gasping for breath.

The "holluschickie" are urged along over the path leading to the killing grounds with very little trouble, and require only three or four men to guide and secure as many thousand at a time. They are permitted frequently to halt and cool off, as heating them injures their fur. These seal halts on the road always impressed me with a species of sentimentalism and regard for the creatures themselves. The men dropping back for a few moments, the awkward shambling and scuffling of the march at once ceases, and the seals stop in their tracks to fan themselves with their hind-flippers, while their heaving flanks give rise to subdued panting sounds. As soon as they apparently cease to gasp for want of breath and are cooled off comparatively the natives step up once more, clatter a few bones with a shout along

[1] The task of getting up early in the morning and going out to the several hauling grounds, closely adjacent, is really all there is of the labor involved in securing the number of seals required for the day's work on the killing grounds. The two, three, or four natives upon whom, in rotation, this duty is devolved by the order of their chief, rise at first glimpse of dawn, between 1 and 2 o'clock, and hasten over to Lukannon, Tolstoi, or Zoltoi, as the case may be, "walk out" their "holluschickie," and have them duly on the slaughtering field before 6 or 7 o'clock, as a rule, in the morning. In favorable weather the "drive" from Tolstoi consumes two and a half to three hours' time; from Lukannon about two hours, and is often done in an hour and a half, while Zoltoi is so near by that the time is merely nominal.

I heard a great deal of talk among the white residents of St. Paul, when I first landed and the sealing season opened, about the necessity of "resting" the hauling grounds. In other words, they said that if the seals were driven in repeated daily rotation from any one of the hauling grounds that this would so disturb these animals as to prevent their coming to any extent again thereon during the rest of the season. This theory seemed rational enough to me at the beginning of my investigations and I was not disposed to question its accuracy, but subsequent observation directed to this point particularly satisfied me and the sealers themselves with whom I was associated that the driving of the seals had no effect whatever upon the hauling which took place soon or immediately after the field, for the hour, had been swept clean of seals by the drivers. If the weather was favorable for landing, i. e., cool, moist, and foggy, the fresh hauling of the "holluschickie" would cover the bare grounds again in a very short space of time—sometimes in a few hours after the driving of every seal from Zoltoi sands over to the killing fields adjacent those dunes and the beach in question would be swarming anew with fresh arrivals. If, however, the weather is abnormally warm and sunny during its prevalence, even if for several consecutive days, no seals to speak of will haul out on the emptied space. Indeed, if these "holluschickie" had not been taken away by man from Zoltoi or any other hauling ground on the islands when "tayopli" weather prevailed, most of those seals would have vacated their terrestrial loafing places for the cooler embraces of the sea. The importance of clearly understanding this fact as to the readiness of the "holluschickie" to haul promptly out on steadily "swept" ground, provided the weather is inviting, is very great, because when not understood it was deemed necessary, even as late as the season of 1872, to "rest" the hauling grounds near the village (from which all the driving has been made since), and make trips to far away Polavina and distant Zapadnie—an unnecessary expenditure of human time and a causeless infliction of physical misery upon phocine backs and flippers.

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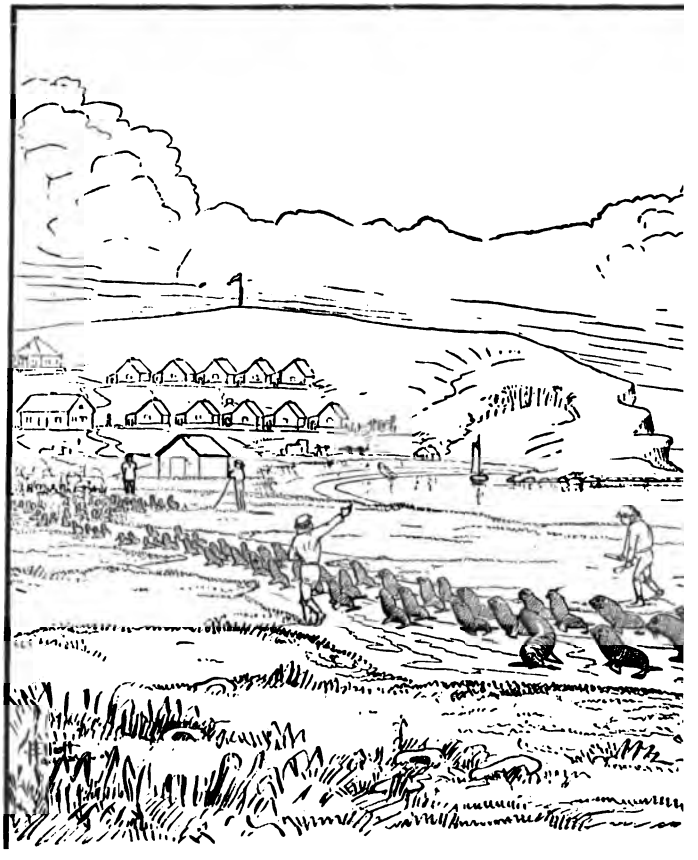
Plate XIII.



NATIVES DRIVIN

The drove passing over the lagoon flats to tl

Looking S. S. W. over the village

HOLLUSCHICKIE."

rounds, under the village hill, St. Paul Island.

Breeding Rookery, July 14, 1872.

the line, and the seal shamble begins again—their march to death and the markets of the world is taken up anew.

DOCILITY OF FUR SEALS WHEN DRIVEN.—I was also impressed by the singular docility and amiability of these animals when driven along the road. They never show fight any more than a flock of sheep would do. If, however, a few old seals get mixed in, they usually get so weary that they prefer to come to a standstill and fight rather than move. Otherwise no sign whatever of resistance is made by the drove from the moment it is intercepted and turned up from the hauling grounds to the time of its destruction at the hands of the sealing gang.

This disposition of the old seals to fight rather than endure the panting torture of travel is of great advantage to all parties concerned; for they are worthless commercially, and the natives are only too glad to let them drop behind, where they remain unmolested, eventually returning to the sea. The fur on them is of little or no value; their under wool being very much shorter, coarser, and more scant than in the younger, especially so on the posterior parts along the median line of the back.

CHANGE IN PELAGE.—This change for the worse or deterioration of the pelage of the fur seal takes place, as a rule, in the fifth year of their age. It is thickest and finest in texture during the third and fourth year of life; hence in driving the seals on St. Paul and St. George up from the hauling grounds the natives make, as far as practicable, a selection from males of that age.

It is quite impossible, however, to get them all of one age without an extraordinary amount of stir and bustle, which the Aleuts do not like to precipitate; hence the drive will be found to consist usually of a bare majority of 3 and 4 year olds, the rest being 2-year-olds principally, and a very few, at wide intervals, 5-year-olds, the yearlings seldom ever getting mixed up.

METHOD OF LAND TRAVEL.—As the drove progresses along the path to the slaughtering grounds the seals all move in about the same way. They go ahead with a kind of walking step and a sliding, shambling gallop. The progression of the whole caravan is a succession of starts, spasmodic and irregular, made every few minutes, the seals pausing to catch their breath and make, as it were, a plaintive survey and mute protest. Every now and then a seal will get weak in the lumbar region, then drag its posteriors along for a short distance, finally drop breathless and exhausted, quivering and panting, not to revive for hours—days, perhaps—and often never. During the driest driving days, or those days when the temperature does not combine with wet fog to keep the path moist and cool, quite a large number of the weakest animals in the drove will be thus laid out and left on the track. If one of these prostrate seals is not too much heated at the time, the native driver usually taps the beast over the head and removes its skin.[1]

[1] The fur seal, like all of the pinnipeds, has no sweat glands; hence, when it is heated, it cools off by the same process of panting which is so characteristic of the dog, accompanied by the fanning that I have hitherto fully described; the heavy breathing and low grunting of a tired drove of seals on a warmer day than usual can be heard several hundred yards away. It is surprising how quickly the hair and fur will come out of the skin of a blood-heated seal—literally rubs bodily off at a touch of the finger. A fine specimen of a 3-year-old "holluschak" fell in its tracks at the head of the lagoon while being driven to the village killing grounds. I asked that it be skinned with special reference to mounting; accordingly, a native was sent for, who was on the spot, knife in hand, within less than thirty minutes from the moment that this seal fell in the road; yet, soon after he had got fairly to work, patches of the fur and hair came off here and there wherever he chanced to clutch the skin.

PROSTRATION OF FUR SEALS BY HEAT.—This prostration from exertion will always happen, no matter how carefully they are driven; and in the longer drives, such as 2½ and 5 miles, from Zapadnie on the west or Polavina on the north to the village at St. Paul, as much as 3 or 4 per cent of the whole drive will thus be dropped on the road; hence I feel satisfied, from my observation and close attention to this feature, that a considerable number of those that are thus rejected from the drove and are able to rally and return to the water die subsequently from internal injuries sustained on the trip, superinduced by this overexertion. I therefore think it highly improper and impolitic to extend drives of the "holluschickie" over any distance on St. Paul Island exceeding a mile or a mile and a half. It is better for all parties concerned, and the business too, that salt houses be erected and killing grounds established contiguous to all of the great hauling grounds, 2 miles distant from the village on St. Paul Island, should the business ever be developed above the present limit or should the exigencies of the future require a quota from all these places, in order to make up the 100,000 which may be lawfully taken.

ABUNDANT SUPPLY OF "HOLLUSCHICKIE."—As matters are to-day, 100,000 seals alone on St. Paul can be taken and skinned in less than forty working days within a radius of 1½ miles from the village and from the salt house at Northeast Point; hence the driving, with the exception of two experimental droves which I witnessed in 1872, has never been made from longer distances than Tolstoi to the eastward, Lukannon to the northward, and Zoltoi to the southward, of the killing grounds at St. Paul village. Should, however, an abnormal season recur, in which the larger proportion of days during the right period for taking the skins be warmish and dry, it might be necessary, in order to get even 75,000 seals within the twenty-eight or thirty days of their prime condition, for drives to be made from the other great hauling grounds to the westward and northward, which are now, and have been for the last ten years, entirely unnoticed by the sealers.

KILLING THE SEALS.—The seals, when finally driven up on those flats between the east landing and the village, and almost under the windows of the dwellings, are herded there until cool and rested. The drives are usually made very early in the morning, at the first breaking of day, which is half past 1 to 2 o'clock of June and July in these latitudes. They arrive and cool off on the slaughtering grounds, so that by 6 or 7 o'clock, after breakfast, the able-bodied male population turn out from the village and go down to engage in the work of slaughter. The men are dressed in their ordinary working garb of thick flannel shirts, stout cassimere or canvas pants, over which the "tarbossa" boots are drawn. If it rains, they wear their "kamlaikas," made of the intestines and throats of the sea lion and fur seal. Thus dressed, they are each armed with a club, a stout oaken or hickory bludgeon, which have been made particularly for the purpose at New London, Conn., and imported here for this especial service. These sealing clubs are about 5 or 6 feet in length, 3 inches in diameter at their heads, and the thickness of a man's forearm where they are grasped by the hands. Each native also has his stabbing knife, his skinning knife, and his whetstone. These are laid upon the grass convenient when the work of braining or knocking the seals down is in progress. This is all the apparatus which they have for killing and skinning.

THE KILLING GANG AT WORK.—When the men gather for work they are under the control of their chosen foremen or chiefs; usually,

Plate XIV.

THE KILL

Method of slaughtering Fur-seals

The drove in waiting. **Sealers knocking down**

AT WORK.

ls, near the village, St. Paul Island.

Natives skinning.

on St. Paul, divided into two working parties at the village and a subparty at Northeast Point, where another salt house and slaughtering field is established. At the signal of the chief the work of the day begins by the men stepping into the drove, corraled on the flats, and, driving out from it 100 or 150 seals at a time, make what they call a "pod," which they surround in a circle, huddling the seals one on another as they narrow it down, until they are directly within reach and under their clubs. Then the chief, after he has cast his experienced eye over the struggling, writhing "kautickie" in the center, passes the word that such and such a seal is bitten, that such and such a seal is too young, that such and such a seal is too old; the attention of his men being called to these points, he gives the word "Strike!" and instantly the heavy clubs come down all around, and every one that is eligible is stretched out stunned and motionless, in less time, really, than I take to tell it. Those seals spared by order of the chief now struggle from under and over the bodies of their insensible companions and pass, hustled off by the natives, back to the sea.[1]

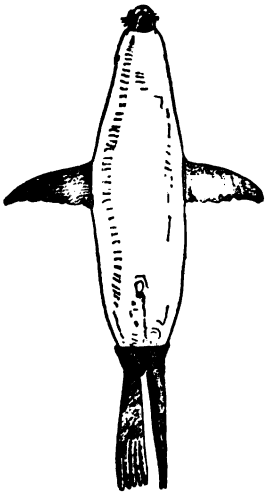
METHOD OF ALEUTS IN SKINNING FUR SEALS.—The clubs are dropped, the men seize the prostrate seals by the hind flippers and drag them out, so they are spread on the ground without touching each other; then every sealer takes his knife and drives it into the heart at a point between the fore flippers of each stunned form; the blood gushes forth, and the quivering of the animal presently ceases. A single stroke of a heavy oak bludgeon, well and fairly delivered, will crush in at once the slight, thin bones of a fur seal's skull, and lay the creature out almost lifeless. These blows are, however, usually repeated two or three times with each animal, but they are very quickly done. The bleeding, which is immediately effected, is so speedily undertaken in order that the strange reaction, which the sealers call "heating," shall be delayed for half an hour or so, or until the seals can all be drawn out and laid in some disposition for skinning.

I have noticed that within less than thirty minutes from the time a perfectly sound seal was knocked down it had so "heated," owing to the day being warmer and drier than usual, that, when touching it with my foot, great patches of hair and fur scaled off. This is a rather exceptionally rapid metamorphosis—it will, however, take place in every instance within an hour or an hour and a half on these warm days after the first blow is struck and the seal is quiet in death; hence no time is lost by the prudent chief in directing the removal of the skins as rapidly as the seals are knocked down and

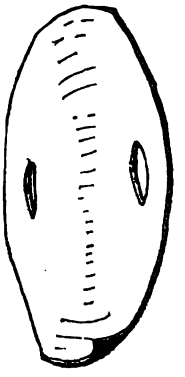
[1] The aim and force with which the native directs his blow determines the death of the seal; if struck direct and violently, a single stroke is enough; the seals' heads are stricken so hard sometimes that those crystalline lenses to their eyes fly out from the orbital sockets like hailstones, or little pebbles, and frequently struck me sharply in the face or elsewhere while I stood near by watching the killing gang at work. A singular lurid-green light suddenly suffuses the eye of the fur seal at intervals when it is very much excited, as the "podding" for the clubbers is in progress, and at the moment when last raising its head, as it sees the uplifted bludgeons on every hand above, fear seems then for the first time to possess it and to instantly gild its eye in this strange manner. When the seal is brained in this state of optical coloration, I have noticed that the opalescent tinting remained well defined for many hours or a whole day after death; these remarkable flashes are very characteristic to the eyes of the old males during their hurly-burly on the rookeries, but never appear in the younger classes unless as just described, as far as I could observe.

dragged out. If it is a cool day, after bleeding the first "pod" which has been prostrated in the manner described, and after carefully drawing the slain from the heap in which they have fallen, so that the bodies will spread over the ground just free from touching one another, they turn to and strike down another "pod," and so on, until a whole thousand or two are laid out, or the drove, as corralled, is finished. The day, however, must be raw and cold for this wholesale method. Then, after killing, they turn to work and skin; but if it is a warm day, every pod is skinned as soon as it is knocked down.

The labor of skinning is exceedingly severe, and is trying even to an expert, demanding long practice ere the muscles of the back and thighs are so developed as to permit a man to bend down to and finish well a fair day's work. The knives used by the natives for skinning are ordinary kitchen or case-handle butcher knives. They are sharpened to cutting edges as keen as razors, but something about the



The flensed carcass of a fur seal.



The skin as taken therefrom.

skins of the seal, perhaps fine comminuted sand along the abdomen, so dulls these knives as the natives work that they are constantly obliged to whet them.

The body of the seal, preparatory to skinning, is rolled over and balanced squarely on its back. Then the native makes a single swift cut through the skin down along the neck, chest, and belly, from the lower jaw to the root of the tail, using for this purpose his long stabbing knife.[1] The fore and hind flippers are then successively lifted

[1] When turning the stunned and senseless carcasses, the only physical danger of which the sealers run the slightest risk, during the whole circuit of their work, occurs thus: At this moment the prone and quivering body of the "holluschak" is not wholly inert, perhaps, though it is nine times out of ten; and, as the native takes hold of a fore flipper to jerk the carcass over on to its back, the half brained seal rouses, snaps suddenly and viciously, often biting the hands or legs of the unwary skinners, who then come leisurely and unconcernedly up into the surgeon's office at the village for bandages, etc.; a few men are bitten every day or two during the season on the islands, in this manner, but I have never learned of any serious result following any case.

The sealers, as might be expected, become exceedingly expert in keeping their

as the man straddles the seal and stoops down to his work over it, and a sweeping circular incision is made through the skin on them just at the point where the body fur ends. Then, seizing a flap of the hide on either one side or the other of the abdomen, the man proceeds, with his smaller, shorter butcher knife, rapidly to cut the skin clean and free from the body and blubber, which he rolls over and out from the hide by hauling up on it as he advances with his work, standing all this time stooped over the carcass, so that his hands are but slightly above it or the ground. This operation of skinning a fair-sized "holluschak" takes the best men only one minute and a half; but the average time made by the gang on the ground is about four minutes to the seal. Nothing is left of the skin upon the carcass save a small patch of each upper lip on which the coarse mustache grows, the skin on the tip of the lower jaw, the insignificant tail,[1] together with the bare hide of the flippers.

BLUBBER OF FUR SEAL; UNPLEASANT ODOR.—On the removal of the skin from the body of the fur seal the entire surface of the carcass is covered with a more or less dense layer or envelope of a soft, oily, fat blubber, which in turn completely conceals the muscles or flesh of the trunk and neck. This fatty substance which we now see resembles that met with in the seals generally everywhere, only possessing that

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knives sharp, putting edges on them as keen as razors, and in an instant detect any dullness, by passing the balls of their thumbs over the suspected edges of the blades. The white sealers of the Antarctic always used the orthodox butchers' "steel" in sharpening their knives, but these natives never have, and probably never will abandon those little whetstones above referred to.

During the Russian management, and throughout the strife in killing by our own people in 1868, a very large number of the skins were cut through, here and there, by the slipping of the natives' knives, when they were taking them from the carcasses, and "flensing" them from the superabundance, in spots, of blubber. These knife cuts through the skin, no matter how slight, give great annoyance to the dresser; hence they are always marked down in price. The prompt scrutiny of each skin on the islands, by the agent of the Alaska Commercial Company, who rejects every one of them thus injured, has caused the natives to exercise greater care, and the number now so damaged every season is absolutely trifling. Another source of small loss is due to a habit which the "holluschickie" have of occasionally biting one another when they are being urged along in the drives, and thus crowded once in awhile one upon the other; usually these examples of "zoobäden" are detected by the natives prior to the "knocking down" and spared, yet those which have been nipped on the chest or abdomen can not be thus noticed; and until the skin is lifted, the damage is not apprehended.

[1]This tail of the fur seal is just a suggestion of the article and that is all. Unlike the abbreviated caudal extremities of the bear or the rabbit, it does not seem to be under the slightest control of its owner—at least I never could see it move to any appreciable degree, when the seal is in action on land. Certainly there is no service required of it, but it does appear to me rather singular that none of the changeful moods of *Callorhinus* are capable of giving rise to even a tremor in its short stump of a tail. It is never raised or depressed, and in fact amounts to a mere excresence, which many casual observers would not notice. The shrinking, twitching movements of the seal's skin, here and there at irregular intervals, are especially noticed when that animal is asleep, so that even when awake I believe that the dermatological motion is an involuntary one. The tail of the sea lion is equally inconsequential; that of the walrus, even more so, while *Phoca vitulina* has one a trifle longer, relatively, and much stouter—fleshier than that of the fur seal.

I found that the natives here were pronounced evolutionists, as are all the many Indian tribes with which I have been thrown in contact during my travels from Mexico to the head of the Stickeen River. They declare that their remote ancestry undoubtedly were fur seals; indeed, there is a better showing for the brain cases of the fur seal over that of the monkey's skull as to weight with reference to physical bulk; while their tails are as short or even shorter than most of the anthropoid apes.

strange peculiarity, not shared by any other of its kind, of being positively overbearing and offensive in odor to the unaccustomed human nostril. The rotting, sloughing carcasses round about did not, when stirred up, affect me more unpleasantly than did this strong, sickening smell of the fur-seal blubber. It has a character and appearance intermediate between those belonging to the adipose tissue found on the bodies of cetacea and some carnivora.

This continuous envelope of blubber to the bodies of the "holluschickie" is thickest in deposit at those points upon the breast between the fore flippers, reaching entirely around and over the shoulders, where it is from 1 inch to a little over in depth. Upon the outer side of the chest it is not half an inch in thickness, frequently not more than a quarter; and it thins out considerably as it reaches the median line of the back. The neck and head are clad by an unbroken continuation of the same material, which varies from one-half to one-quarter of an inch in depth. Toward the middle line of the abdominal region there is a layer of relative greater thickness. This is coextensive with the sterno-pectoral mass; but it does not begin to retain its volume as it extends backward, where this fatty investment of the carcass upon the loins, buttocks, and hinder limbs fades out finer than on the pectoro-abdominal parts, and assumes a thickening corresponding to the depth on the cervical and dorsal regions. As it descends on the limbs this blubber thins out very perceptibly, and when reaching the flippers it almost entirely disappears, giving way to a glistening aureolar tissue, while the flipper skin finally descends in turn to adhere closely and firmly to the tendinous ligamentary structures beneath, which constitute the tips of the *Pinnipedia*.

The flesh and the muscles are not lined between or within by fat of any kind. This blubber envelope contains it all with one exception—that which is found in the folds of the small intestine and about the kidneys, where there is an abundant secretion of a harder, whiter, though still offensive, fat.

FLESH OF FUR SEAL AS AN ARTICLE OF DIET.—It is quite natural for our people, when they first eat a meal on the Pribilof Islands, to ask questions in regard to what seal meat looks and tastes like. Some of the white residents will answer, saying they are very fond of it, cooked so and so; others will reply that in no shape or manner can they stomach the dish. The inquirers must needs try the effect on their own palates. I frankly confess that I had a slight prejudice against seal meat at first, having preconceived ideas that it would be fishy in flavor, but I soon satisfied myself to the contrary, and found that the flesh of young seals not over three years old was full as appetizing and toothsome as most of the beef, mutton, and pork I was accustomed to at home. The following precautions must be rigidly observed, however, by the cook who prepares the fur-seal steaks and sausage balls for our delectation and subsistence—he will fail if he does not.

First. The meat must be perfectly cleaned of every vestige of blubber or fat, no matter how slight.

Second. Cut the flesh, then, into very thin steaks or slices, and soak them from six to twelve hours in salt and water (a tablespoon of fine salt to a quart of fresh water); this whitens the meat, and removes the residuum of dark venous blood that will otherwise give a slightly disagreeable taste, hardly definable, though existing.

Third. Fry these steaks or stew them a la mode with a few thin slices of sweet "breakfast" bacon, seasoning with pepper and salt. A

own gravy follows the cooking of the meat. Serve hot, and it is, judged, a very excellent meal for the daintiest feeder—and I recommend it confidently as a safe venture for any newcomer e.

T OF THE SEA LION.—The flesh of young sea lions is still better at of the fur seal, while the natives say that the meat of the hair *hoca vitulina*) is superior to both, being more juicy. Fur-seal s exceedingly dry; hence the necessity of putting bacon into the pan or stew pot with it. Sea-lion flesh is an improvement in this t, and also that its fat, strange to say, is wholly clear, white, odorous, while the blubber of the "holluschickie" is sickening smell, and will, nine times out of ten, cause any civilized h to throw it up as quickly as it was swallowed. The natives, er, eat a great deal of it, simply because they are too lazy to heir fur-seal cuts, and not because they really relish it.

is connection it may be well to add that the liver of both *Cal-us* and *Eumetopias* is sweet and wholesome; or, in other words, ood as liver usually is in Fulton market. The tongues are white, and fat. They are regularly cut out to some extent, alted in ordinary water buckets for exportation to curious s. They have but slight claim to gastronomic favor. The s are, however, very partial to the liver; but, though they like gues, yet they are too lazy to prepare them. A few of them, lience to pressing and prayerful appeals from relatives at Una-do exert themselves enough every season to undergo the extra of putting up a few barrels of fresh salted seal meat, which, carried down to Illoolook by the company's vessels, affords a ful variation to the steady and monotonous codfish diet of the an islanders.

ER AUTHORITIES ON HAIR-SEAL MEAT.—An old writer, in describ-n and things in the western islands of Scotland (Martin, 1716), ot give the same evidence of appreciation. He says that the there "salt the seals with the ashes of burnt seaware (algoid spermæ), and say they are good food. The vulgar eat them nly in the springtime, with a long pointed stick instead of a o prevent the strong smell which their hands otherwise would r several hours afterwards. The flesh and broth of fresh young s, by experience, known to be pectoral. The meat is astringent, ed as an effectual remedy against diarrhea and dysentery. The f a seal being dried and pulverized, and afterwards a little of it with milk (aquavitae) or red wine, is also good against fluxes." in, "the seal, though esteemed only fit for the vulgar, is also by persons of distinction, though under a different name, to wit, also, a pleasant smile involuntarily arises to the face of the alist when he learns from the same old writer that "the popish of the islands to the southward from this [island] eat these n Lent instead of fish." Martin refers to *Phoca fœtida*, I think.

IVES' USE OF FUR-SEAL FLESH MEDICINALLY.—I could not learn he natives on the Pribilof Islands that they held any notions of inal virtue whatever in regard to the flesh of the fur seal or other eds indigenous. They do make certain special uses of the liver, estes, etc., but the exact application I could not satisfactorily nine. They considered the establishment of our surgeon and acy as a direct vote of censure upon their therapeutics, and were lling to forget what they knew whenever I asked leading ques-on the subject.

FIRST ESTABLISHMENT OF A PHARMACY: NATIVES THEIR OWN SURGEONS.—The natives, prior to the transfer of the territory, as well as the agents and employees of the old Russian company, were compelled to do their own doctoring and surgery as best they knew how, and with the scanty supply of natural and artificial resources at their command. They may be, therefore, truly described as having been helpless in the presence of serious physical ailment. When our Government took possession of Alaska, they brought with them, however, the first physicians and supplies that had ever had lodgment on the Pribilof Islands, and when these officers took their departure with the troops, their services and stores were naturally suggested as desirable of continuance. Accordingly, the Alaska Commercial Company, when it took the business control of the islands, 1870–71, promptly established a doctor and a pharmacy on each island, and latterly a small hospital has been erected and sustained by it at St. Paul. These physicians are agents of the company, under salary, and are directed to give their time and attention to all illness on either island free of charge, also dispensing needful medicines, etc., gratis. Dr. Otto Cramer, a native of Berlin, was the surgeon on St. Paul during my sojourn there, and I recall his sad death at sea in 1875 with unfeigned regret, for he was a singularly well-read gentleman and an accomplished physician, musician, and scholarly in his mind. He was a victim to acute melancholia. Some heavy shadow was hanging from his early life over him which none of us cared to lift.

STOLID BEHAVIOR OF NATIVES WHEN INJURED.—Dr. Cramer often said, speaking of the peculiarities of the natives when sick at St. Paul, that they never notified him of their illness until the diseases had usually got so firm hold of the patients as to baffle all medical relief. He complained that they would let the old Shamanistic doctress of the village charm, drug, and weary the sick until death seemed imminent, and then stolidly send for him. "Ochta, mein Gott! too late, too late, such people!" he would usually conclude his account of this case or that, as it might be.

NATIVE METHODS OF COOKING.—The native cooking is now all done in their houses, on small cast-iron stoves of American pattern and make. In olden times the unavoidable use of fur-seal blubber in culinary operations caused the erection, outside of most "barrabaras," of a small sod-walled and low dirt-roofed kitchen, in which the strong-smelling blubber fires were kindled. Indifferent as the native became to smells and smoke in the filthy life of early days upon these islands, yet the acrid, stifling, asthmatic effect of the blubber clouds never failed to punish him whenever he attempted to make use of such a fire in his living room. Most of these "cookhnets" or "povarniks" were in full blast when I first landed at St. Paul, and coming frequently into range of their smoky effluvium I was infinitely annoyed; now, however, the complete substitution of new frame houses for the "barrabkies" has, I believe, caused a perfect abatement of the nuisance.

The people of the seal islands indulge in very liberal quantities of boiled seal meat and tea. These staples, together with hard bread or soda crackers, form the routine of their bill of fare as far as cooking goes, varied at wide intervals by boiled halibut, stewed or roasted birds, and the queerly-scrambled eggs of the same. The more ancient these oölogical viands, the better for Aleutian gusto. Some of the women, however, have learned to bake bread and biscuits, but this consumes too much of the scant fuel at their disposal to be a popular or general practice among them. They sit at tables in their houses

now, on benches, and eat from plates with knives and forks, instead of squatting around an iron pot on the "barrabkie" floor to dip in, sans ceremonie, with spoons, ladles, and grimy fingers, as in "ye olden tyme." They have, however, one sad failing developed by this march to a higher civilization, and that is the determination of the Aleutian dishwasher to use cold water on her greasy plates.

GREAT SIZE OF THE FUR SEAL'S HEART: ITS EXPANDED LUNGS.—In opening many hundreds of these freshly-killed seals after skinning, while searching in vain for supposed food contents of their stomachs, I was impressed by the exceeding size of the heart and the perfect organization of the lungs, while the volume of blood in proportion to the size and weight is, I am sure, greater in the fur seal than in any other animal. The enormous lungs and the veins, laid bare, showed their beautiful adaptation to frequent aquatic submergence by their great capacity toward the root of the heart and by the enormous cava or hepatic reservoir. The widened aortic arch and the diminution of the abdominal aorta modify the blood current, of which the vast muscular apparatus of the forequarters and the large brain must receive the major share of supply, as it comes from the enlarged heart.[1]

MANNER OF CARING FOR AND SHIPPING THE FUR-SEAL SKINS.

CURING THE RAW SKINS.—The skins are taken from the field to the salt house, where they are laid out, after being again carefully examined, one upon another, "hair to fat," like so many sheets of paper, with salt profusely spread upon the fleshy sides as they are piled up in the "kenches," or bins.[2] The salt house is a large barn-like frame

[1] I had prepared many notes upon the muscular anatomy of the fur seal and the sea lion, but I find that it has been anticipated so well by what Dr. Murie published in the transactions of the Zoological Society of London, 1869–1872, as to render their reproduction here quite superfluous. These observations of Dr. Murie constitute one of the most valuable contributions to the knowledge of the anatomy of this animal that has ever been made. He carefully dissected a young male sea lion after its death, which had been brought to the Zoological Society's gardens from the Falkland Islands.

[2] The practice of curing in early times was quite different from this rapid and effective process of salting. The skins were then all air dried; pegged out, when "green," upon the ground, or else stretched upon a wooden trellis or frame, which stood like a rude fence adjacent to the killing grounds; it was the accumulation of such air-dried skins from the Pribilof Islands, at Sitka, which rotted so in 1803 that "750,000 of them were cut up, or thrown out into the sea," completely destroyed. Had they been treated as they now are, such a calamity and hideous waste could not have occurred. The method of air drying which the old settlers employed is well portrayed by the practice of the natives now, who treat a few hundred sea-lion skins to the process every fall; preparing them thus for shipment to Unalaska, where they are used by brother Aleuts in covering their bidarkies or kyacks. The natives, in speaking to me of this matter, said that whenever the weather was rough and the wind blowing hard, these air-dried seal skins, as they were tossed from the bidarrah to the ship's deck, numbers of them would frequently turn in the wind and fly clean over the vessel into the water beyond, where they were lost. Under the old order of affairs, prior to the present management, the skins were packed up and carried on the backs of the boys and girls, women and old men, to the salt houses, or drying frames. When I first arrived, season of 1872, a slight variation was made in this respect by breaking a small Siberian bull into harness and hitching it to a cart, in which the pelts were hauled. Before the cart was adjusted, however, and the "buik" taught to pull, it was led out to the killing grounds, by a ring in its nose, and literally covered with the green seal hides, which were thus packed to the kenches. The natives were delighted with even this partial assistance; but now they have no further concern about it at all, for several mules and carts render prompt and ample service. They were introduced here, first, in 1874. The Russian-American Company and also the Alaska

structure, so built as to afford one-third of its width in the center, from end to end, clear and open as a passage way; while on each side are rows of stanchions, with sliding planks, which are taken down and put up in the form of deep bins, or boxes—"kenches," the sealers call them. As the pile of skins is laid at the bottom of an empty "kench," and salt thrown in on the outer edges, these planks are also put in place, so that the salt may be kept intact until the bin is filled as high up as a man can toss the skins. After lying two or three weeks in this style they become "pickled," and they are suited then at any time to be taken up and rolled into bundles of two skins to the package, with the hairy side out, tightly corded, ready for shipment from the islands.

AVERAGE WEIGHT OF RAW SKINS.—The average weight of a 2-year-old skin is 5½ pounds; of a 3-year-old skin, 7 pounds, and of a 4-year-old skin, 12 pounds; so that as the major portion of the catch is 2 or 3 year olds, these bundles of two skins each have an average weight of from 12 to 15 pounds. In this shape they go into the hold of the company's steamer at St. Paul,[1] and are counted out from it in San Francisco. Then they are either at once shipped to London by the Isthmus of Panama in the same shape, only packed up in large hogsheads of from 20 to 40 bundles to the package, or expressed by railroad, via New York, to the same destination.

PACKING SKINS FOR SHIPMENT.—The work of bundling the skins is not usually commenced by the natives until the close of the last week's sealing; or, in other words, those skins which they first took, three weeks ago, are now so pickled by the salt in which they have

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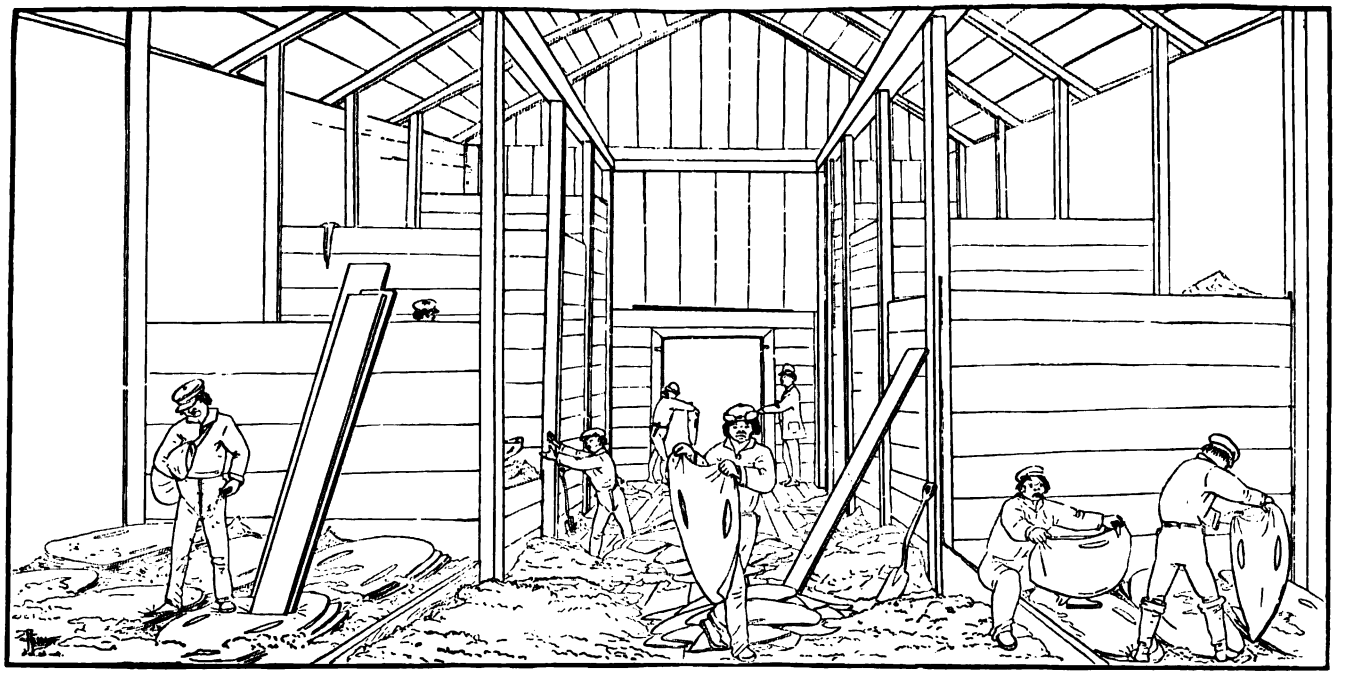
Commercial Company have brought up three or four horses to St. Paul, but they have been unfortunate in losing them all soon after landing, the voyage and the climate combined being inimical to equine health; but the mules of the present order of affairs have been successful in their transportation to and residence on the Pribilof Islands. One, the first of these horses just referred to, perhaps did not have a fair chance for its life. It was saddled one morning, and several camp kettles, coffee pots, etc., slung on the crupper for the use of the Russian agent, who was going up to Northeast Point for a week or ten days' visit. He got into the saddle, and while en route, near Polavina, a kettle or pot broke loose behind, the alarmed horse kicked its rider promptly off, and disappeared on a full run in the fog, going toward the bogs of Kamminista, where its lifeless and fox-gnawed body was found several days afterwards.

[1] The shallow depths of Bering Sea give rise to a very bad surf, and though none of the natives can swim, as far as I could learn, yet they are quite creditable surfmen, and work the heavy "baidar," in and out from the landing adroitly and circumspectly. They put a sentinel upon the bluffs over Nah Speel, and go and come between the rollers as he signals. They are not graceful oarsmen under any circumstances, but can pull heartily and coolly together when in a pinch. The apparent ease and unconcern with which they handled their bidarrah here in the "baroon" during the fall of 1869, so emboldened three or four sailors of the United States revenue marine cutter *Lincoln* that they lost their lives in that surf through sheer carelessness. The "gig" in which they were coming ashore "broached to" in the breakers just outside of the cove, and their lifeless forms were soon after thrown up by the merciless waves on the Lagoon rookery. Three graves of these men are plainly marked on the slope of the Black Bluffs.

There is a false air of listlessness and gentleness about an open sea, or roadstead roller, that is very apt to deceive even watermen of good understanding. The crushing, overwhelming power with which an ordinary breaker will hurl a large ship's boat on rocks awash must be personally experienced ere it is half appreciated.

The bundled skins are carried from the salt houses to the baidar, when the order for shipment is given, and pitched into that lighter one by one, to be rapidly stowed; 700 to 1,200 bundles make the average single load; then, when alongside the steamer, they are again tossed up and on her deck, from whence they are stowed in the hold.



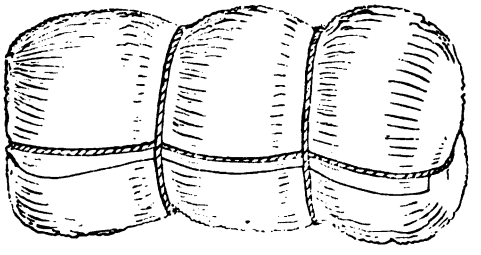
KENCHING FUR-SEAL SKINS.

Interior of the Salt-house at the village, St. Paul Island. Natives planting the pelts in the curing bins or "kenches;" salting, assorting, etc.

been lying ever since, as to render them eligible for this operation and immediate shipment. The moisture of the air dissolves and destroys a very large quantity of the saline preservative which the company brings up annually in the form of rock salt, principally obtained at Carmen Island, Lower California.

LAW PROTECTING THE SEALS.—The Alaska Commercial Company, by the provisions of law under which they enjoy their franchise, are permitted to take 100,000 male seals annually, and no more, from the Pribilof Islands. This they do in June and July of every year. After that season the skins rapidly grow worthless, as the animals enter into shedding, and, if taken, would not pay for transportation and the tax. These natives are paid 40 cents a skin for the labor, and they keep a close account of the progress of the work every day; they do so, as it is all done by them, and they know within 50 skins, one way or the other, when the whole number have been secured each season. This is the only occupation of the 398 people here, and they naturally look well after it. The interest and close attention paid by these natives, on both islands, to the "holluschickie" and this business was both gratifying and instructive to me during my residence there.

ERRONEOUS POPULAR IDEAS.—The common or popular notion in regard to seal skins is that they are worn by those animals just as



A bundle of two skins.

they appear when offered for sale; that the fur seal swims about, exposing the same soft coat with which our ladies of fashion so delight to cover their tender forms during inclement winter. This is a very great mistake; few skins are less attractive than is the seal skin when it is taken from the creature. The fur is not visible; it is concealed entirely by a coat of stiff overhair, dull, gray-brown, and grizzled. It takes three of them to make a lady's sacque and boa; and in order that the reason for their costliness may be apparent, I take great pleasure in submitting a description of the tedious and skillful labor necessary to their dressing ere they are fit for sale, which will be found in the appendix.

SKETCH OF THE RUSSIO-CHINA TRADE IN FUR-SEAL PELTRIES.—During the whole of the extended period, from 1799 to 1867, inclusive, the Russians shipped and sold nearly all of the fur-seal skins that were taken from the Pribilof Islands, in that great international mart of Kiachta, on the Chinese frontier. Since the Americans have taken control, the sales have all been practically made in London. The Alaska Commercial Company sells every one of its skins from the Pribilof and Commander groups there, in the same wareroom where the Hudson Bay Company, when it had a thrifty existence and was a power, used to auction its furs annually. As millions of the air-dried pelts taken from the seal islands of Alaska have been bartered

in the China-Russian station, a brief description of Kiachta may be interesting.

Prior to 1722 the Russians enjoyed a treaty with China which sanctioned the individual traveling of Muscovitic traders direct from the frontier to Peking. After a period of three and thirty years the Russians were abruptly and entirely deprived of those coveted commercial privileges. After all intercourse between the two countries had ceased for five years, the Russians obtained a new treaty in 1728, by which, in order to prevent future misunderstandings, the international trade, as far at least as private individuals were concerned, should be conducted on the boundary line, exactly upon the same spot where this new treaty was negotiated. Here Kiachta was built, though she still had a rival in Peking; for, by the provisions of the new treaty, government trading caravans were allowed to penetrate to the capital of the Chinese empire. But, in 1762, Catharine II relinquished this imperial monopoly, and that action at once rendered this little town the grand and sole emporium of commerce between Russia and China.

DESCRIPTION OF KIACHTA.—Kiachta, then as now, stands on a rivulet of the same name, which, rising in Siberia and crossing the frontier line, washes the foundations of Maimatschin, a China town only a few miles away. Taken by itself, it is beset on all sides by rugged mountains; and the streamlet which forms a bond of union between these large empires of Asia is so tiny that, even by the aid of damming, it often fails to afford an adequate supply of water to the four or five thousand dwellers on its banks. These two small settlements, Kiachta and Maimatschin, are situated as nearly as possible on the fiftieth parallel of latitude, being about 1,000 miles from Peking and 4,000 from Moscow. Though the Chinese route is much the shortest on the map, it is practically as hard a journey; for at a distance of about a week's march from Peking the Chinese have a forty days' tramp, and upward, over a dismal desert of table-land. It is parched with heat during one-half of the year and covered with snow during the other. The Russians, however, whether they come from the west with manufactured goods, or from the north and east with furs, enjoy the advantages of a peopled country and of navigable waters nearly all the way to Irkutsk, and when they have met at this, the common center of all the lines of communication, they may, and often do, prosecute the rest of their journey to the very neighborhood of Kiachta by crossing Lake Baikal and ascending its principal tributary, the Selenga River.

CHARACTER OF THE TRADE.—The Russian traders bring chiefly furs, woolens, cottons, and linens, while the Chinese bring teas principally, also silks, and sugar candy; thus the seal skins of Alaska were wont to go first from the seal islands to Sitka; there they were assorted and put up into square bales, about 3 feet by 2, pressing the bundles in an old-fashioned hand-lever press, and cording them while under this pressure; then envelopes of green walrus hide were sewed over them, and the packages, duly numbered, went to the Okhotsk by ship, then to Kiachta by pack horses, where the buyers of Pekin finally inspected and purchased them, giving in exchange the celebrated black teas of Maimatschin, the finest brands in all Mongolia, and produced only in the north of China, and which can be more cheaply transported from thence to Siberia than to Canton.

CHINESE DISPOSITION OF FUR-SEAL PELTRIES.—The Chinese buyers sent their Pribilof peltries down to their home markets on camels,

and in carts drawn by oxen, to Kalgan, where the seal skins were again sold to other dealers, who carried them to the ultimate retail trade.

VOLUME OF KIACHTA TRADE IN 1837.—What the fur trade of Kiachta to-day is, even though the rare skin of *Callorhinus* is seldom seen, I can find no data; but in 1837 the native land furs were represented by a value of 7,406,188 rubles, and the peltries from Russian America, including the fur seals, sea otter, and all the Alaskan land catch, was 1,600,000 rubles. How many fur seals were sold in this aggregate I can not ascertain, but the scanty yield during the two and three years preceding would not warrant any considerable showing.

CHINESE TRADERS.—The Chinese at Kiachta were at first much more shrewd in their bargains than were their Russian neighbors; but the Slavonic instincts did not need much brushing up ere they were fully equal to all emergencies. The methods of the Chinese in selecting seal skins were elaborate and lengthy. Each pelt was handled and measured, then a little metal tag attached on which the result was recorded. I find a great deal of confusion in the data at my command as to what the average price was in this market, because the Russians took all ages, and at all stages of the season, from June to December; consequently the number of really prime skins was small compared with the whole aggregate sold. The best pelts brought from "10 to 15 rubles" ($8 to $12.50); the average sales were made, however, as low as from $4 to $5 per skin. Techmainov gives the most information touching the value of Russian-American furs in those times that I can find; but, in regard to specific figures for the fur-seal quotations, he is only vague and general, the reason doubtless being that the whole volume of trade at Kiachta was and is exclusively one of barter, without the intervention of coin on either side.

SEASON OF KIACHTA COMMERCE.—The business life of Kiachta is never fully aroused until winter has well set in, continuing until spring. There is no written regulation to this effect, but it has the force of law through habit. In disposing of their commodities, the Chinese have considerable local advantage, because their teas never remain a single season unsold at Maimatschin, while the Russian goods, partly through a diminution of the demand and partly through the artifices of the Celestials, are often so depreciated in value as to have to wait two and three years for a market.

DEMAND OF CHINESE FOR FURS.—The Chinese have from time immemorial been solicitous purchasers of furs. The northern provinces of their dominions are not only subjected to an extremely rigorous winter climate, but are those where the most wealthy reside, because the best teas of the Celestial Empire grow there; hence the desire for fur robes and garments as measures of comfort during cold weather is universal among the inhabitants; they constitute an important part of the wardrobe of every important Chinaman throughout all "Kathay." A Russian authority, Paul von Krusenstern, says: "With the least change of air the Chinese immediately alter their dress; and even at Canton, which is within the confines of the tropics, they wear furs in the winter."

FIRST TRAFFIC IN FURS BETWEEN AMERICA AND CHINA.—It is a curious fact, that until Capt. John Gore anchored, December 18, 1779, near Canton with the ships of Cook's last voyage, from Kamchatka and the northward, the furs which these English seamen then offered

to the Chinese for sale were the first peltries ever brought into their markets by sea. The Chinese had hitherto gained everything of this character from without their precincts, by overland trade with Siberian merchants, or from the Burmese frontier via Bhamo.

When Captain Gore, the surviving senior officer of Cook's last voyage, 1776–1780, returned to England, he found that war was existing with the United States, France, and Spain. The British Government determined to withhold from the world all information of the voyage; hence it was not until the winter of 1784–85 that it was published. The statements contained in this work respecting the great abundance of animals yielding fine furs on the northwest coast, and the successful pecuniary bartering of the ships at Canton, stirred up a great many active men who fitted out vessels for the traffic. The first individual trader from the south on the northwest coast was John Hanna, an Englishman, who sailed from Canton, May, 1785, and filled his little schooner with sea-otter skins at Nootka; then Portlock and Dixon and Meares, in 1786; Gray and Kendrick, the first Americans, in 1787, head a long list of traders who came successively after them. In no record whatever of this pelagic fur trade can I find any mention made of the skin of the fur seal, nor the slightest hint whatever until the period of the Fraser River gold excitement, in 1862, when the first quotation of a fur-seal skin is made, taken at sea off the Straits of Fuca.

WHAT THE RUSSIANS KNEW OF THE BUSINESS.—Perhaps the best and an entirely correct epitome of what the Russians at headquarters of the company in Sitka really knew, biographically and commercially, of the fur seal, is embodied in the following words of Governor Simpson, of the Hudson Bay Company, who, in 1841–42, was the guest of Governor Etholine. He had supreme control of Alaskan life and trade then, and gave to his English official peer doubtless all the knowledge which he possessed:

Some twenty or thirty years ago there was a most wasteful destruction of the seal, when young and old, male and female, were indiscriminately knocked on the head. This imprudence, as any one might have expected, proved detrimental in two ways. The race was almost extirpated, and the market was glutted to such a degree, at the rate for some time of 200,000 skins a year, that the prices did not even pay the expenses of carriage. The Russians, however, have now adopted nearly the same plan which the Hudson Bay Company pursues in recruiting any of its exhausted districts, killing only a limited number of such males as have attained their full growth, a plan peculiarly applicable to the fur seal, inasmuch as its habits render the system of husbanding the stock as easy and certain as that of destroying it.

In the month of May, with something like the regularity of an almanac, the fur seals make their appearance at the island of St. Paul, one of the Aleutian group. Each old male brings a herd of females under his protection, varying in number according to his size and strength. The weaker brethren are obliged to content themselves with half a dozen wives, while some of the sturdier and fiercer fellows preside over harems that are 200 strong. From the date of their arrival in May to that of their departure in October, the whole of them are principally ashore on the beach. The females go down to the sea once or twice a day, while the male, morning, noon, and night, watches his charge with the utmost jealousy, postponing even the pleasures of eating and drinking and sleeping to the duty of keeping his favorites together. If any young gallant ventures by stealth among any senior chief's bevy of beauties, he generally atones for his imprudence with his life, being torn to pieces by the old fellow, and such of the fair ones as may have given the intruder any encouragement are pretty sure to catch it in the shape of some secondary punishment. The ladies are in the straw about a fortnight after they arrive at St. Paul; about two or three weeks afterward they lay the single foundation, being all that is necessary, of next season's proceeding, and the remainder of their sojourn they devote exclusively to the rearing of their young. At last the whole band departs, no one knows whither. The mode of capture is this: At the proper

time the whole are driven like a flock of sheep to the establishment which is a mile distant from the sea, and there the males of four years, with the exception of the few that are left to keep up the breed, are separated from the rest and killed. In the days of promiscuous massacre such of the mothers as had lost their pups would ever and anon return to the establishment, absolutely harrowing up the sympathies of the wives and the daughters of the hunters, accustomed as they were to such scenes, with their doleful lamentations.

The fur seal attains the age of 15 or 20 years, but not more. The females do not bring forth young till they are 5 years old. The hunters have frequently marked their ears each season, and many of the animals have been notched in this way ten times, but very few of them oftener.

Under the present system the fur seals are increasing rapidly in number. Previously to its introduction, the animal hunts had dwindled down to three and four thousand. They have now gradually got up to thrice that amount, and they are likely soon to equal the full demand, not exceeding 30,000 skins of the Russian Government.[1]

It is valuable as showing that as long ago as 1841–42, under Russian management, more than 30,000 skins per annum would be a loss, and not profitable to take from the seal islands. Also that, though the tardy recognition of the fact that females should not be slaughtered was made on the Pribilof Islands shortly prior to 1841–42, yet suitable regulations had not yet been made for the management of the business, inasmuch as all classes, "as a whole," were driven to the killing grounds. This harassed and disturbed the females quite as badly as if killed outright. In 1845 the present order of implicit non-trespass upon the breeding rookeries was first established, and I am sorry that I can not find the name of the intelligent Russian who promulgated it, so that it might be known and respected, as it so well deserves.

NO FUR SEALS KNOWN TO EARLY TRADE.—The homely, yet explicit, letters of William Beresford should be noticed, for he sailed from London in 1797–98, as a trader with Portlock and Dixon, and he gives, perhaps, the only straightforward synopsis of the fur trade of the northwest coast as it was then. He reviews the subject as it presents itself to him from Cooks Inlet to Cape Mendocino in the series of field notes which are printed and form the body and soul of Dixon's Voyage.

Nowhere does the author mention the fur seal in this narrative, covering as it does two years' cruising between Kadiak and Cape Flattery. He evidently had not even heard of it, though at the time the Russians were working the Pribilof Islands barbarously, taking hundreds of thousands of skins.

When I first went to the northwest coast, May, 1865, I learned from the venerable Dr. Tolmie, a recently retired chief factor of the Vancouver (Hudson Bay Company's) district, a great deal of the fur-bearing animals of that country, as known to the celebrated company which he had represented. I find no mention in my memoranda made at the time that he indicated the skin of the fur seal as one of the long list of items of trade; and while I was in that country between the Stikeen mouth and Puget Sound, 1865–1867, inclusive, I never heard a single word of the fur seal, and I, myself, then never recognized its name. I do not think, therefore, it worth while to discuss the idle rumors, now prevalent to some extent, as to the "fact" that the fur seal is breeding in some lonely nook here and there along the coast. The Indians would have known it full well a hundred years ago, and such anxious seekers after choice peltries as William Beresford and the Hudson Bay Company would have profited accordingly.

[1] An Overland Journey Around the World, 1841–42, Sir George Simpson, governor in chief Hudson Bay Company's territories; Philadelphia, 1847, pp. 130–131.

PELAGIC FUR SEALING A RECENT ENTERPRISE.—Fur seals then, as now, were annually seen in all probability by the natives of the coast at sea, between Prince of Wales Island and the Columbia River; but either they were not deemed worthy of the labor in capture, or else the superior value of the sea-otter chase drew every attention of the pelagic hunters, just as it does to-day. At least I feel warranted in this conclusion by the full and explicit details which Alexander Mackenzie gives of the furs that he saw in the natives' possession when he came overland from Montreal to the Pacific Ocean in 1793. He describes the sea otter almost exclusively. He speaks, however, of the natives having seal's flesh for sale; that it was eaten raw, "cut into chunks." Most likely this seal meat of Mackenzie's notice was that of *Phoca vitulina*, which animal I have seen myself nearly 100 miles up the Fraser River from the coast. However, it may have been that of the fur seal, for he was among those savages who inhabited the islands and coast of Queen Charlotte Sound, where these animals are to-day often seen sleeping or sporting in the broad reach of that open roadstead.

ECONOMIC VALUE OF THE SKINS, OIL, AND FLESH OF THE FUR SEAL.

REASON WHY FUR-SEAL SKINS ARE ALL SOLD IN LONDON.—On account of the fact that the labor in this country, especially skilled labor, commands so much more per diem in the return of wages than it does in London or Belgium, it is not practicable for the Alaska Commercial Company, or any other company here, to attempt to dress and put upon the market the catch of Bering Sea, which is, in fact, the entire catch of the whole world. Our people understand the theory of dressing these skins perfectly, but they can not compete with the cheaper labor of the Old World. Therefore nine-tenths nearly of the fur-seal skins taken every year are annually purchased and dressed in London, and from thence distributed all over the civilized world where furs are worn and prized.

CAUSE OF VARYING PRICES OF DRESSED SEAL SKINS.—The great variations of the value of seal-skin sacques, ranging from $75 up to $350, and even $500, is not often due to the variance in the quality of the fur originally, but it is due to the quality of the work whereby the fur was treated and prepared for wear. For instance, the cheap sacques are so defectively dyed that a little moisture causes them to soil the collars and cuffs of their owners, and a little exposure causes them speedily to fade and look ragged. A properly dyed skin, one that has been conscientiously and laboriously finished—for it is a labor requiring great patience and great skill—will not rub off or "crock" the whitest linen when moistened; and it will wear the weather, as I have myself seen it on the form of a sea captain's wife, for six or seven successive seasons without showing the least bit of dimness or raggedness. I speak of dyeing alone; I might say the carlier steps of unhairing in which the overhair is deftly combed out and off from the skin, heated to such a point that the roots of the fur are not loosened, while those of the coarser hirsute growth are. If this is not done with perfect uniformity, the fur will never lay smooth, no matter how skillfully dyed; it will always have a rumpled, ruffled look. Therefore the hastily dyed sacques are cheap, and are enhanced in order of value just as the labor of dyeing is expended upon them.

GRADATION OF THE FUR OF CALLORHINUS URSINUS.—The grada-

tion of the fur of *Callorhinus* may, perhaps, be best presented in the following manner:

One-year-old male, well grown, at July 1 of every season: Fur fully developed as to uniform length and thickness and evenness of distribution. It is lighter in color and softer in texture than hereafter during the life of the animal. Average weight of skin as removed by the sealers from the carcass, 4½ pounds.

Two-year-old male, well grown, at June 1 of every season: Fur fully developed as to even length and thickness and uniformity of distribution. It has now attained the darker buff and fawn color, sometimes almost brown, which it retains throughout the rest of the life of the animal. It is slightly and perceptibly firmer and stiffer than it was last year, not being at all "fluffy" as in the yearling dress now. Average weight of skin, as taken from the body, 5½ pounds.

Three-year-old male, well grown, at June 1 of every season: Fur fully developed, as to even length, but a shade longer over the shoulders, where the incipient "wig" is forming; otherwise perfectly uniform in thickness and even distribution. This is the very best grade of pelt which the seal affords during its life. Average weight of skin, as taken from the body, 7 pounds.

Four-year-old male, well grown, at June 1 of every season: Fur fully developed as to even length, except a decided advance in length and perceptible stiffness over the shoulders in the "wig;" otherwise perfectly uniform in thickness and even distribution. This grade is almost as safe to take and as good as is the three-year-old. Average weight of skin as removed, 12 pounds.

Five-year-old male, well grown, at May to June 1 of every season: Fur fully developed, but much longer and decidedly coarser in the "wig" region; otherwise uniform in thickness and distribution. The coarseness of the fur over the shoulders and disproportionate length thereon destroys that uniformity necessary for rating A 1 in the market; in fact, it does not pay to take this skin. Average weight, 16 pounds.

Six-year-old male, well grown, from May to June 1 of every season: Fur fully developed, still longer, and stiffer in the "wig" region, with a slightly thinner distribution over the post-dorsal region, and shorter. This skin is never taken; it is profitless. Average weight, 25 pounds.

Seven-year-old and upward male, from May to June 1 of every season: Fur fully developed, but very unevenly distributed, being relatively scant and short over the posterior dorsal region, while it is twice as long and very coarse in the covering to the shoulders especially and the neck and chest. Skins are valueless to the fur trade. Weights, 45 to 60 pounds.

The analysis, as above, is a brief epitome of the entire subject; only it should be added that the female skins are as finely furred as are the best grades of the males; and also, that age does not cause the quality of their pelage to deteriorate, which it does to so marked an extent in the males. But, taking them into consideration is entirely out of the question, and ought to be so forever.

The fœtal coat of the pup is composed of coarse black hair alone, the under wool not at all developed. When this is shed and the new coat put on in September and October, it is furred and haired as a yearling, which I diagnose above; this pelage has, however, no commercial value.

All the skins taken by the company for the last eight years have been prime skins, in the fair sense of the term; but all the seal-skin sacks made therefrom have not been of the first quality by any means.

In order that the rules and regulations and the law governing and protecting the interests of the Government on these islands may be fully understood, I embody them in the appendix.

OIL OF THE FUR SEAL.—I have spoken of the blubber, and as I mentioned it doubtless the thought will occur, What becomes of the oil contained therein—is it all allowed to waste? A most natural query and one that I made instantly after my first arrival on the islands. I remember seeing 40 or 50 hogsheads and tierces headed up and standing near the foot of the village hill, in which were many thousands of gallons of fur-seal oil. I asked the agent of the company when he was going to ship it. He shrugged his shoulders and said, "As soon as it will pay."

I made during the season careful notes as to the amount of oil represented by the blubber exposed on the 100,000 young male seal carcasses, and I found that the 2 and 3 year old "holluschickie" bodies as left by the skinner would not clean up on an average more than half a gallon of oil, while the 4-year-old males would make nearly a gallon. It should be remembered that quite a large portion of the seal's fat is taken off with the skin, as its presence thereon is necessary to that proper amalgamation and preservation by the salt when it is applied to its fresh surface in the "kenches." Hence the amount of oil represented by these carcasses every year is not much over 60,000 gallons.

CONDITION OF THE FUR-SEAL OIL MARKET.—When among the seal-oil dealers in New York City during the month of May in 1876, I took these notes with me and investigated the standing and the demand for fur-seal oil in their market and the markets of the world, and the statements of these oil experts and dealers were all in accord as to the striking inferiority of fur-seal oil compared with the hair-seal and sea-elephant oil, which they dealt in largely. The inferiority of the fur-seal oil is due primarily to the offensive odor of the blubber, which I have spoken of heretofore. This singularly disagreeable smell does not exist in the blubber of the hair seal (*Phocidæ*), the sea elephant, or sea lion, and it makes the process of refining very difficult. They said it was almost impossible to properly deodorize it and leave the slightest margin of profit for the manufacturer and the dealer. It was gummy and far darker in color than any other seal oil. Hence it possessed little or no commercial value. Then, again, when the subject of taking oil from the seal islands of Alaska is considered, the following obstacles, in addition to the first great objection just cited, arise at once to financial success: The time, trouble, and danger in loading a vessel with oil at the islands, where, on account of the absence of a harbor and the frequent succession of violent gales, a ship is compelled to anchor from a mile and a half to 3 miles from the coast, on which the surf is always breaking. The cost, again, of casks and cooperage will amount to 10 cents per gallon; the cost of the natives' work in securing and bringing the blubber to the try works, 10 cents per gallon; the cost of refining it, 10 cents; and the cost of transportation of a cargo of, say, 60,000 gallons will amount to nearly 20 cents per gallon, thus making a gallon of fur-seal oil aggregate in cost to the taker 50 cents, which entails upon him nothing but pecuniary loss when the cargo goes upon the market, where it is worth only from 40 to 50 cents retail, with a dull sale at that.[1]

[1] In 1873, not having had any experience, and not even knowing the views of the oil dealers themselves, I left the seal islands believing that if the special tax which was then laid upon each gallon of oil as it might be rendered was removed, that it would pay the manufacturer, and in this way employ the natives, many days of the year otherwise idle, profitably. The company assured me that as far as its conduct in the matter was concerned it would be perfectly willing to employ the natives in rendering fur-seal oil and give them all the profit, not desiring itself to coin a single penny out of the whole transaction. Possibly this could be done if the special tax of 55 cents per gallon was stricken off. The matter was then urged upon the Treasury Department by myself in October, 1873, and the tax was repealed by the Department soon after. But it seems that I was entirely mistaken as to the quality and value of the oil itself. I made, to satify myself, a very careful investigation of the subject in 1876, going personally to the leading dealers in whale and seal oil of New York City, and they were unanimous in their opposition to handling fur-seal oil, some of them saying that they would not touch it at any price. I felt considerably chagrined, because had I known as much in 1873 I would have saved myself then, and my friends subsequently, a good deal of *unnecessary* trouble and profitless action.

FRAGILE CHARACTER OF FUR-SEAL BONES.—I looked at the fur-seal bones, and at first sight it seemed as though a bone factory might be established there, but a little examination of the singularly light and porous osseous structure of the *Callorhinas* quickly stifled that enterprise. The skull and larger bones of the skeleton are more like pasteboard than the bone which is so common to our minds. When dried out, the entire skeleton of a 3-year-old male will not weigh 7 pounds. Indeed I am inclined to think it would be much less than that if thoroughly kiln dried as after the fashion of the bone mills. Therefore, although 100,000 of these skeletons bleach out and are trodden down annually upon the Pribilof Islands, yet they have not the standing for any commercial value whatsoever, considering their distance and difficulty of access from those impoverished fields where they might serve our farmers as fertilizing elements.[1]

DECAY OF SEAL CARCASSES.—Another singular and striking characteristic of the island of St. Paul is the fact that this immense slaughtering field, upon which 75,000 to 90,000 fresh carcasses lie every season, sloughing away into the sand beneath, does not cause any sickness among the people who live right over them, so to speak. The cool, raw temperature and strong winds, peculiar to the place, seem to prevent any unhealthy effect from the fermentation of decay. The elymus and other grasses once more take heart and grow with magical vigor over the unsightly spot, to which the sealing gang again return, repeating their bateau, which we have marked before upon this place three years ago. In that way this strip of ground, seen on my map between the village, the east landing, and the lagoon, contains the bones and the oil drippings and other fragments thereof of more than 3,000,000 seals slain since 1786 thereon, while the slaughter fields at Novastoshnah record the end of a million more.

I remember well the unmitigated sensations of disgust that possessed me when I first landed, April 28, 1872, on the Pribilof Islands, and passed up from the beach at Lukannon to the village over the killing grounds. Though there was a heavy coat of snow on the fields, yet each and every one of 75,000 decaying carcasses was there, and bare, having burned, as it were, their way out to the open air, polluting the

[1]The bones of *Callorhinus*, though apparently strong, are surprisingly light and porous; indeed, they resemble those of *Aves* more than those commonly credited to mammalia. The osseous structure, however, of *Phoca vitulina*, the hair seal which I examined there, side by side with that of the fur seal, was very much more solid and weighed, bone for bone of equal age, just about one-third more, the skull especially; also the shoulder blades and the pelvic series. If the bones of the animals were not divested of their cartilaginous continuations and connections, then the aggregate weight of the fur seal is equal to its hairy-skinned relative. The entire skeleton of a 3-year-old male *Callorhinus*, completely divested by sea fleas (*Amphipoda*) of all flesh and fat, but with every ligamentary union and articulation perfect (the cartilaginous toe ends all present), was just 8 pounds, and I have reason to believe that when it became air dried and bleached it did not weigh more than 4 or 5. The bones of the older seals are relatively very much heavier, but only relatively. The frailness and fragility are constant through life, though the skulls of the old males do thicken up on their crests and about the rami of their jaws very perceptibly. Sea-lion bones are, however, normally strong and heavy. The bone of the fur seal is evidently stout enough, but it is singularly light, while the walrus, that dull, sluggish brute, has a massive osteological frame. I made these relative examinations more especially to ascertain something which might pass for a correct estimate of what the bony waste on the killing grounds of the Pribilof Islands amounted to annually, with a view of its possible utilization. The spongy bones of the whole 100,000 annually laid out would not render, according to my best judgment, 50 tons of dry bone meal—an insignificant result and unworthy of further notice on these islands.

same to a sad degree. I was laughed at by the residents who noticed my facial contortions, and assured that this state of smell was nothing to what I should soon experience when the frost and snow had fairly melted. They were correct; the odor along by the end of May was terrific punishment to my olfactories, and continued so for several weeks until my sense of smell became blunted and callous to this stench by long familiarity. Like the other old residents I then became quite unconscious of the prevalence of this rich "funk" and ceased to notice it.

Those who land here, as I did, for the first time, nervously and invariably declare that such an atmosphere must breed a plague or a fever of some kind in the village, and hardly credit the assurance of those who have resided in it for the whole period of their lives that such a thing was never known to St. Paul, and that the island is remarkably healthy. It is entirely true, however, and after a few weeks' contact, or a couple of months' experience at the longest, the most sensitive nose becomes used to that aroma, wafted as it is hourly, day in and out, from decaying seal flesh, viscera, and blubber; and, also, it ceases to be an object of attention. The cool, sunless climate during the warmer months has undoubtedly much to do with checking too rapid decomposition and consequent trouble therefrom, which would otherwise arise from the killing grounds.

The freshly skinned carcasses of this season do not seem to rot substantially until the following year; then they rapidly slough away into the sand upon which they rest. The envelope of blubber left upon each body seems to act as an air-tight receiver, holding most of the putrid gases that evolved from the decaying viscera until their volatile tension causes it to give way. Fortunately, the line of least resistance to that merciful retort is usually right where it is adjacent to the soil, so both putrescent fluids and much of the stench within is deodorized and absorbed before it can contaminate the atmosphere to any great extent. The truth of my observation will be promptly verified if the skeptic chooses to tear open any one of the thousands of gas-distended carcasses in the fall that were skinned in the killing season. If he does so, he will be smitten by the worst smell that human sense can measure; and should he chance to be accompanied by a native, that callous individual, even, will pinch his grimy nose and exclaim, "It is a 'keeshla pahknoot!'"

At the close of the third season after the skinning of the seal's body it will have so rotted and sloughed down as to be marked only by the bones and a few of the tendinous ligaments; in other words, it requires from thirty to thirty-six months' time for a seal carcass to rot entirely away, so nothing but whitened bones remain above ground. The natives govern their driving of the seals and laying out of the fresh bodies according to this fact; for they can and do spread this year a whole season's killing out over the same spot of the field previously covered with such fresh carcasses three summers ago. By alternating with the seasons thus the natives are enabled to annually slaughter all of the "holluschickie" on a relatively small area, close by the salt houses and the village, as I have indicated on the map of St. Paul.

DESCRIPTION OF KILLING GROUND OF ST. PAUL.—The killing ground of St. Paul is a bottomless sand flat, only a few feet above high water, and which unites the village hill and the reef with the island itself. It is not a stone's throw from the heart of the settlement; in fact, it is right in town—not even suburban.

DESCRIPTION OF THE KILLING GROUND AT ST. GEORGE.—On St.

George the "holluschickie" are regularly driven to that northeast slope of the village hill which drops down gently to the sea, where they are slaughtered close by and under the houses, as at St. Paul. Those droves which are brought in from the North Rookery to the west, and also Starry Ateel, are frequently driven right through the village itself. This slaughtering field of St. George is hard tufa and rocky, but it slopes down to the ocean rapidly enough to drain itself well; hence the constant rain and humid fogs of summer carry off that which would soon clog and deprive the natives from using the ground year after year in rotation, as they do. Several seasons have occurred, however, when this natural cleansing of the ground above mentioned has not been as thorough as must be to be used again immediately. Then the seals were skinned back of the village hill and in the ravine to the west on the same slope from the summit.

This village site of St. George to-day, and the killing grounds adjoining, used to be, during early Russian occupation, in Pribilof's time, a large sea-lion rookery, the finest one known to either island, St. Paul or St. George. Natives are living there who told me that their fathers had been employed in shooting and driving these sea lions so as to deliberately break up the breeding ground, and thus rid the island of what they considered a superabundant supply of the *Eumetopias*, and thereby to aid and encourage the fresh and increased accession of fur seals from the vast majority peculiar to St. Paul, which could not take place while the sea lions held the land.[1]

LIFE HISTORY OF THE SEA LION.

NATURAL INFERIORITY TO THE FUR SEAL.—This animal, also a characteristic pinniped of the Pribilof Islands, ranks much below the fur seal in perfected physical organization and intelligence. It can, as well as its more sagacious and valuable relative, the *Callorhinus*, be seen, perhaps, to better advantage on these islands than elsewhere in the whole world that I know of. The marked difference between

[1] The St. Paul village site is located wholly on the northern slope of the village hill, where it drops from its greatest elevation, at the flagstaff, of 125 feet, gently down to the sandy killing flats below and between it and the main body of the island. The houses are all placed facing the north at regular intervals along the terraced streets, which run southeast and northwest. There are 74 or 80 native houses, 10 large and smaller buildings of the company, the Treasury agent's residence; the church, the cemetery crosses, and the school building are all standing here in coats of pure white paint. The survey of the town site when rebuilt was made by Mr. H. W. McIntyre, of the Alaska Commercial Company, who himself planned and devised the entire reconstruction. No offal or decaying refuse of any kind is allowed to stand around the dwellings or lie in the streets. It required much determined effort on the part of the whites to effect this sanitary reform, but now most of the natives take equal pride in keeping their surroundings clean and unpolluted. The site of the St. George settlement is more exposed and bleak than is the one we have just referred to on St. Paul. It is planted directly on the rounded summit of one of the first low hills that rise from the sea on the north shore; indeed, it is the only hill that does slope directly and gently to the salt water on the island. Here are 24 to 30 native cottages laid with their doors facing the opposite sides of a short street between, running also east and west, as at St. Paul. There, however, each house looks down upon the rear of its neighbor in front and below. Here the houses face each other on the top of the hill. The Treasury agent's quarters, the company's 6 or 7 buildings, the schoolhouse, and the church are all neatly painted, and this settlement, from its prominent position, shows from the sea to a much better advantage than does the larger one of St. Paul. The same municipal sanitary regulations are enforced here. Those who may visit the St. George and St. Paul of to-day will find the streets dry and hard as floors. They have been covered with a thick layer of volcanic cinders on both islands.

the sea lion and the fur seal up here is striking, the former being twice the size of its cousin.

The size and strength of the northern sea lion, *Eumetopias stelleri*, and its perfect adaptation to its physical surroundings unites with a singular climatic elasticity of organization. It seems to be equally as well satisfied with the ice floes of the Kamchatka Sea to the northward or the polished bowlders and the hot sands of the coast of California.[1] It is an animal, as it appeared upon its accustomed breeding grounds at Northeast Point, where I saw it, that commanded my admiration by its imposing presence and sonorous voice, rearing itself before me with head, neck, and chest upon its powerful forearms, over 6 feet in height, while its heavy bass voice drowned the booming of the surf that thundered on the rocks at its flanks.

THE PHYSICAL PRESENCE OF THE SEA LION.—The size and strength of the adult sea-lion male will be better appreciated when I say that it has an average length of 10 and 11 feet osteologically, with an enormous girth of 8 to 9 feet around the chest and shoulders; but while the anterior parts of the frame are as perfect and powerful on land as in sea, those posterior are ridiculously impotent when the huge beast leaves its favorite element. Still, when hauled up beyond the reach of the brawling surf, as it rears itself, shaking the spray from its tawny chest and short grizzly mane, it has that leonine appearance and bearing, greatly enhanced as the season advances by the rich golden rufous color of its coat, the savage gleam of its expression, due probably to the sinister muzzle and cast of its eye. This optical organ is not round and full, soft and limpid, like the fur seal's, but it is an eye like that of a bulldog, small, and clearly showing, under its heavy lids, the white or sclerotic coat, with a light brown iris. Its teeth gleam and glisten in pearly whiteness against the dark tongue and the shadowy recesses of its wide, deep mouth; the long, sharp, broad-based canines, when bared by the wrathful snarling of its gristled lips, glittered more wickedly, to my eye, than the keenest sword ever did in the hand of man.[2]

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[1] The sea lion certainly seems to have a more elastic constitution than is possessed by the fur seal; in other words, the former can live under greater natural extremes of climate than can the latter. A careful test of this question was made by the late R. B. Woodward, in the acquaria of his famous gardens at San Francisco. He told me at the Grand Hotel, in 1873, that he should not attempt to keep another fur seal alive in his tanks; that every one of the half dozen live specimens which he had placed therein at different intervals during the last three years had died—began to droop and waste away as soon as they were installed in their new quarters; but he seldom lost a sea lion, except from clear or natural reasons. Mr. Woodward, from his practical experience, was positive in his belief that no living adult fur seal could ever be exhibited in New York; while he thought that the sea lion, both *Zalophus* and *Eumetopias*, could be carried alive, and in good condition, all over this country from New Orleans to Montreal, or San Francisco to Bangor. He said, "Our black sea lion (*Zalophus*) is tougher than the larger kind (*Eumetopias*), and is just the creature for showmen."

[2] The teeth of the fur seal are not, as a rule, clean and white, as they are in the mouths of most carnivora; they are badly discolored by black, brown, and yellowish coatings, especially so with regard to the males. The pup's milk teeth are complete exponents of the dental formula of adolescence, but are small, brittle, mostly black and brown in color; with their shedding, however, the permanent teeth come out quite clear and glistening white; still, again, in a year or two they rapidly lose their purity of tint, being discolored as above stated. The sea-lion pups, also, are born with dingy, dusky milk teeth, but I found that when their permanent set was grown it usually retained, even into old age, its primitive whiteness. This difference between these animals is quite marked, which, together with the opposite characters of their blubber, mentioned hereafter, constitute a

Plate XVI.

Yearling. Pup.

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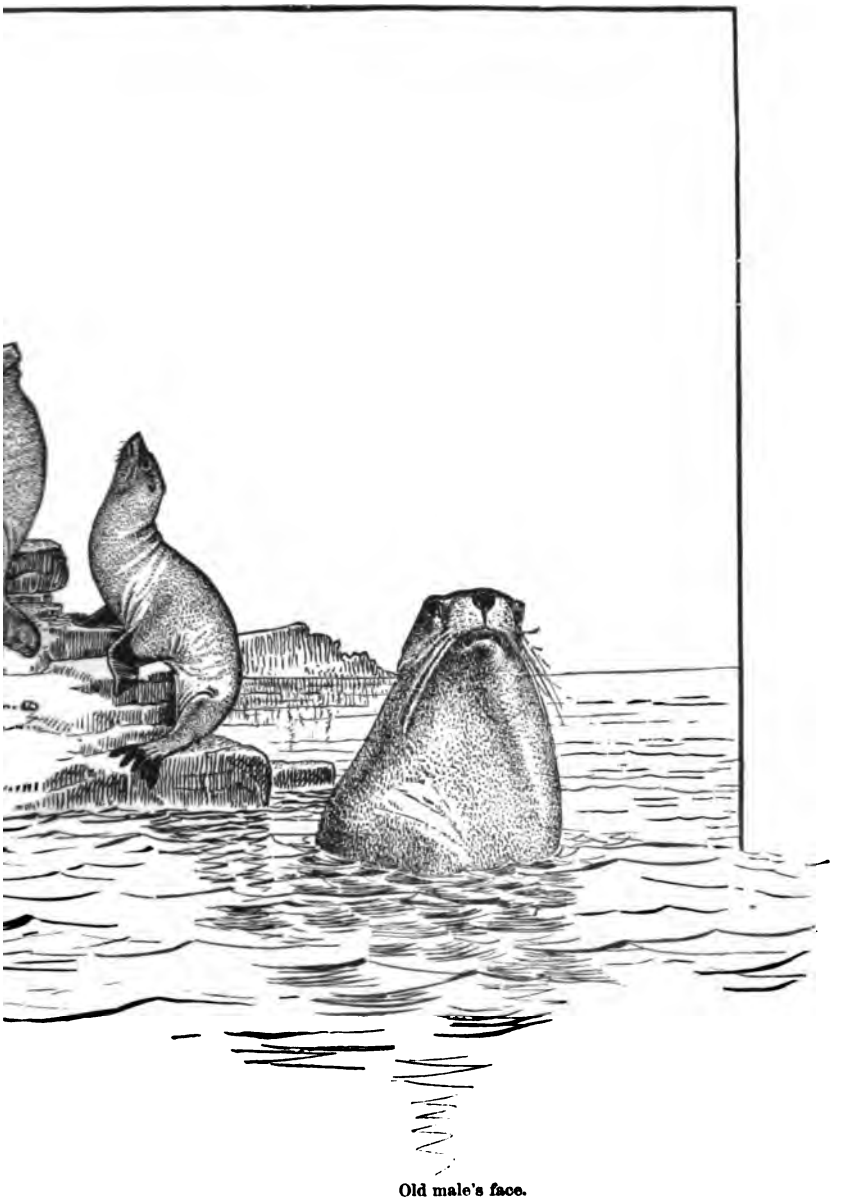
(Eumetopias S

Life-studies by



Old male's face.

ON.

es and females.)

Islands. 1872–'76.

With these teeth alone, backed by the enormous muscular power of a mighty neck and broad shoulders, the sea lion confines its battles to its kind, spurred by terrible energy and heedless and persistent brute courage. No animals that I have ever seen in combat presented a more savage or more cruelly fascinating sight than did a brace of old sea-lion bulls which met under my eyes near the Garden Cove at St. George.

SEA LIONS FIGHTING AT TOLSTOI.—Here was a sea-lion rookery, the outskirts of which I had trodden upon for the first time. These old males, surrounded by their meek, polygamous families, were impelled toward each other by those latent fires of hate and jealousy which seemed to burst forth and fairly consume the angry rivals. Opening with a long, round, vocal prelude, they gradually came together, as the fur-seal bulls do, with averted heads, as though the sight of each other was sickening—but fight they must. One would play against the other for an unguarded moment in which to assume the initiative, until it had struck its fangs into the thick skin of its opponent's jowl; then, clenching its jaws, was not shaken off until the struggles of its tortured victim literally tore them out, leaving an ugly, gaping wound—for the sharp eyeteeth cut a deeper gutter in the skin and flesh than would have held my hand. Fired into almost supernatural rage, the injured lion retaliated quick as a flash in kind; the hair flew from both of them into the air, the blood streamed down in frothy torrents, while high above the boom of the breaking waves and shrill, deafening screams of waterfowl overhead rose the ferocious, hoarse, and desperate roar of the combatants.

LAND TRAVEL OF THE SEA LION.—Though provided with flippers, to all external view, as the fur seal is, the sea lion can not, however, make use of them at all in the same free manner. The fur seal may be driven 5 or 6 miles in twenty-four hours under the most favorable conditions of cool, moist weather; the "seevitchie," however, can only go 2 miles, the conditions of weather and roadway being the same. The sea lion balances and swings its long and heavy neck as a lever to and fro with every hitching up behind of its posterior limbs, which it seldom raises from the ground, drawing them up after the fore feet with a slide over the grass or sand and rocks, as the case may be, ever and anon pausing to take a sullen and savage survey of the field and the natives who are driving them.

The sea lion is polygamous, but it does not maintain any regular system and method in preparing for and attending to its harem, like that so finely illustrated on the breeding grounds of the fur seal; and it is not so numerous, comparatively speaking. There are not, according to my best judgment, over 10,000 or 12,000 of these animals altogether on the breeding grounds of the Pribilof Islands; it does not haul more than a few rods anywhere or under any circumstances back from the sea. It can not be visited and inspected by men as the

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very curious basis of differentiation. The fur-seal pup, when it spits or coughs in fright, opens its mouth wide, and the small black and brown teeth seem sadly out of place set in the bright rosy gums around the fresh pink tinge of the tongue and under the red, flushed palate. The canines and incisors of *Callorhinus* and *Eumetopias* are well rooted, but the molars are not; their alveoli are only partly filled, so that when the fleshy gums are removed these teeth will easily rattle out of their sockets. In looking over hundreds and thousands of the skulls of *Callorhinus* as they bleach out on the killing grounds, I was struck by their astonishing lack of symmetry; they varied fully as much in their extremes as the skulls of many different genera do. The number of teeth differ also; some jaws have but 5 molars, others 6, and others 7.

fur seals are, for it is so shy and suspicious that, on the slightest warning of an approach, a stampede into the water is a certain result.[1]

PECULIAR COWARDICE OF THE SEA LION.—That noteworthy, intelligent courage of the fur seal, though it does not possess half the size nor one-quarter of the muscular strength of the sea lion, is entirely wanting in the huge bulk and brain of the *Eumetopias*. A boy with a rattle or a popgun could stampede 10,000 sea-lion bulls, in the height of the breeding season, to the water; and keep them there for the rest of the season.[2]

FIRST ARRIVALS.—The males come out and locate over the narrow belts of the rookery grounds (sometimes, as at St. Paul, on the immediate sea margin of the fur-seal breeding places), two or three weeks in advance of the females, which arrive later, i. e., between the 1st to the 6th of June; and these females are never subjected to that intense, jealous supervision so characteristic of the fur-seal harem. The sea-lion bulls, however, fight savagely among themselves, and turn off from the breeding ground all the younger and weaker males.

THE FEMALE SEA LION.—The cow sea lion is not quite half the size of the adult male; she will measure from 8 to 9 feet in length osteologically, with a weight of 400 or 500 pounds; she has the same general cast of countenance and build of the bull; but, as she does not sustain any fasting period of over a week or ten days consecutively, she never comes out so grossly fat as the male. With reference to the weight of the latter, I was particularly unfortunate in not being able to get one of those big bulls to the scales before it had been bled; and in bleeding I know that a flood of blood poured out which should have been recorded in the weight. Therefore, I can only estimate this aggregate avoirdupois of one of the finest-conditioned adult male

[1] That the sea-lion bull should be so cowardly in the presence of man, yet so ferocious and brave toward one another and other amphibious animals, struck me as a line of singular contrast with the undaunted bearing of the fur-seal "sea-catch," which, though being not half the size or possessing muscular power to anything like its development in the "seevitchie," nevertheless will unflinchingly face on its station at the rookery any man to the death. The sea-lion bulls certainly fight as savagely and as desperately one with another as the fur-seal males do. There is no question about that, and their superior strength and size only makes the result more effective in the exhibition of gaping wounds and attendant bloodshed. I have repeatedly seen examples of these old warriors of the sea which were literally scarred from their muzzles to their posteriors so badly and so uniformly as to have fairly lost all the color or general appearance even of hair anywhere on their bodies. I recall in this connection the sight of an aged male sea lion which had evidently been defeated by a younger and more lusty rival perhaps. It was hauled upon a lava shelf at Southwest Point, solitary and alone, the rock around it being literally covered with pools of pus, which was oozing out and trickling down from a score of festering wounds. The victim stood planted squarely on its torn fore flippers, with head erect and thrown back upon its shoulders. Its eyes were closed, and it gently swayed its sore neck and shoulders in a sort of troubled, painful day-dreaming or dozing. Like the fur seal, the sea lion never notices its wounds to nurse and lick them, as dogs do, or other carnivora. It never pays the slightest attention to them, no matter how grievously it may be injured.

[2] This marked cowardice of the sea lion was well noted by Steller, who speaks of it thus: "Though the males have a terrible aspect, yet they take flight on the first appearance of man, and if surprised in their sleep they are panic struck, sighing deeply, and in their attempt to escape get quite confused, tumble down, and tremble so much that they are scarcely able to move their limbs. If, however, reduced to extremity they grow desperate, turn on their enemy with great fury and noise, and put even the most valiant to flight." (Nov. Com. Acad. Sci. Petropol., tome II, 1749.)

sea lions at 1,400 to 1,500 pounds; an average weight, however, might safely be recorded as touching 1,200 pounds.[1]

ORGANIZATION OF SEA-LION ROOKERIES.—The sea-lion rookery will be found to consist of about ten to fifteen females to every male. The females, in landing, seem to be influenced by no preference for one male above another, but are actuated solely to come ashore at a suitable place, where, soon after landing, they are to bring forth their young. The cow seems at all times to have the utmost freedom in moving from place to place, and also often to start with its young—which is noteworthy, inasmuch as I never saw it among the fur seals—picking the pup up by the nape and carrying it to the water to play with it for short spells in the surf wash. The pup sea lions are by no means helpless when they are born. When they first come into the world their eyes are promptly opened wide and clear; they stand up quite free and strong on their odd flipper feet, and commence at once, in their frequent intervals of wakefulness, to crawl over bowlders and the sand, to paddle in the surf, and to roar huskily and shrilly at their parents.

GROWTH OF YOUNG SEA LIONS.—They are fed upon the richest of rich milk at irregular and somewhat lengthy periods. Regaled in this manner the young sea lion grows with surprising rapidity, so much so that its weight of 9 or 12 pounds at birth is increased to 75 or 90 in less than four months thereafter. By this time, also, it has shed its natal coat and teeth, it has grown a strong mustache, and has become a facile swimmer and expert fisherman, though at first it was one of the most clumsy, yet never so helpless as the fur seal. The liquid, pearly blue eye of the little fellow is soon changed into the sinister expression of adolescence when it has rounded its second year. It appears to grow up unnoticed by its grim-looking parents, though the maternal attention is more evident, but still scant, indeed, when contrasted with the love evinced by cat or dog for its offspring.

VISITING THE TOLSTOI ROOKERY.—At the east end of St. George Island, just to the southward of Tolstoi Mees, is one of the finest sea-lion rookeries on the islands or perhaps in the world. It lies at the base of a frowning wall of precipitous cliffs, and the mural walls sheer aloft 400 and 500 feet as they overhang the sea. Here beneath, on a rocky stretch of beach some 30 or 40 feet wide at high-water mark, stowed thickly side by side, end to end, and crosswise for a distance of half a mile up and down the coast, are four or five thousand sea

[1] Often when the fur seal and sea-lion bulls haul up in the beginning of the season, examples among them which are inordinately fat will be seen. Their extra avoirdupois renders them very conspicuous, even among large gatherings of their kind. They seem to exhibit a sense of self-oppression then quite as marked as is that subsequent air of depression worn when later they have starved out this load of surplus blubber and are shambling back to the sea for recuperation and rest. I thought over and devised many plans to kill and weigh entire one of these unusually heavy bulls, but they all failed, because I did not have the time to spare from so many other observations pressing and necessary to be made at that season if made at all during the year. The united effort of five or six men, aided by the mule and cart at St. Paul, would solve the problem, doubtless, almost any day they set about it early in May. Some of these superfleshy fur-seal males look as though they were from 600 to 700 pounds weight, while I have seen several sea-lion bulls that actually appeared equal to turning the scales at 1,500 pounds avoirdupois. Those fur seals which I did weigh in July, 1873, and September, 1872, were not at all extra fleshy, and consequently do not give a fair return for these examples above referred to.

lions of all sizes and both sexes, and here they will be found every summer, secure from the approach of enemies by land. Inasmuch as they rest there under the cliffs, they can not be practically approached and driven, as their kind are by the Aleuts from their more accessible breeding haunts at Northeast Point, St. Paul Island.[1]

By paying attention to the direction of the wind the observer can descend at intervals from the heights above, unheeded and unsuspected by them, to within a stone's throw of their tawny forms, where you may notice their thousand and one unconstrained and peculiar maneuvers, which would be interrupted at once by a tumultous and universal rush for the water should you make yourself known. You will be impressed first by their excessive restlessness. They are ever twisting and turning, coiling and uncoiling themselves over the rocks, now stretched out prone in slumber, the next minute up and moving. The roar of one is instantly caught up by another, so that the aggregate sound as it rises and falls from this rookery, reverberating along the bluffs at irregular though close intervals, can only be compared in my mind to the hoarse sound of a tempest as it howls through the rigging of a ship or sighs through the branches of a forest growth.

The voice of the northern sea lion, *Eumetopias*, is confined to either a deep, resonant roar or a low, muttering growl. Not only to the males alone is this monotone peculiar, but also to the females and the young. It does not have that striking flexibility of the *Callorhinus*, and in this respect their vocal organization is very marked and different from that of the fur seal. I might say further that the pups are exceedingly playful, but, unlike the noisy "kotickie," they are almost silent. When they utter a sound it is a short, sharp, querulous growling.

THE YOUNG PROMPTLY DESERTED.—You will notice that if you dis-

[1]It will be noticed that I have made no especial spacing or reservation on my maps for the sea lions at Northeast Point, on St. Paul Island, but have included them solidly within the lines of the breeding fur seals. The reason why I omit these lines of exact limitation is due to the fact that they laid in along the water's edge at intervals so closely with the fur seals and in such apparent good fellowship that I could not observe any sharp demarcation between them, except only the irregular, confused patches of their bright golden coats in contrast with the dull, rusty dress of *Callorhinus*. The *Eumetopias* here, where it was breeding, never lay far back from the surf, but always close to its high-water washings. In this method, I should judge, about 12,000 to 15,000 of them occupy little strips of Novastoshnah and Seevitchie Kammin, being the only rookery spots on the Pribilof Islands where they breed in close juxtaposition with the fur seals. Then there is a sea-lion rookery on St. George, all to itself, under the high mural walls just north of the Garden Cove sand beach, where I estimate another 4,000 or 5,000 of these animals annually haul out and breed. Very likely my allowance of 12,000 to 15,000 sea lions on St. Paul is too large, and 10,000 is a better figure of their numerical expression. My published estimates of 25,000 on the two islands in 1874 I feel now are larger than the facts allow.

As might be inferred, the sea lions at Novastoshnah do not allow the fur seals to disturb them, nor do they in turn ever appear to annoy or drive their physically weaker brethren. They seem to wear an air of perfect unconcern for each other, although the fur-seal bulls, I observed, were never caught lounging over the narrow littoral margins of the sea lion's breeding ground, but meekly bowed their heads and scuttled across, wholly beneath the notice of the huge "seevitchie."

Why the sea lion should be relatively so scant in numbers over the great extent of the large geographical area wherein it is found is perplexing to me, for it is physically as active and much more powerful than the fur seal. Perhaps this increased bulk of body deters it from feeding as successfully as its more lithesome cousin does. I should estimate that the full-grown sea-lion bull, after it leaves the islands at the end of the breeding season until it reappears for the next, would require at least 100 pounds of fish per diem, while the females and younger males would crave and consume from 40 to 60 pounds of such food every twenty-four hours.

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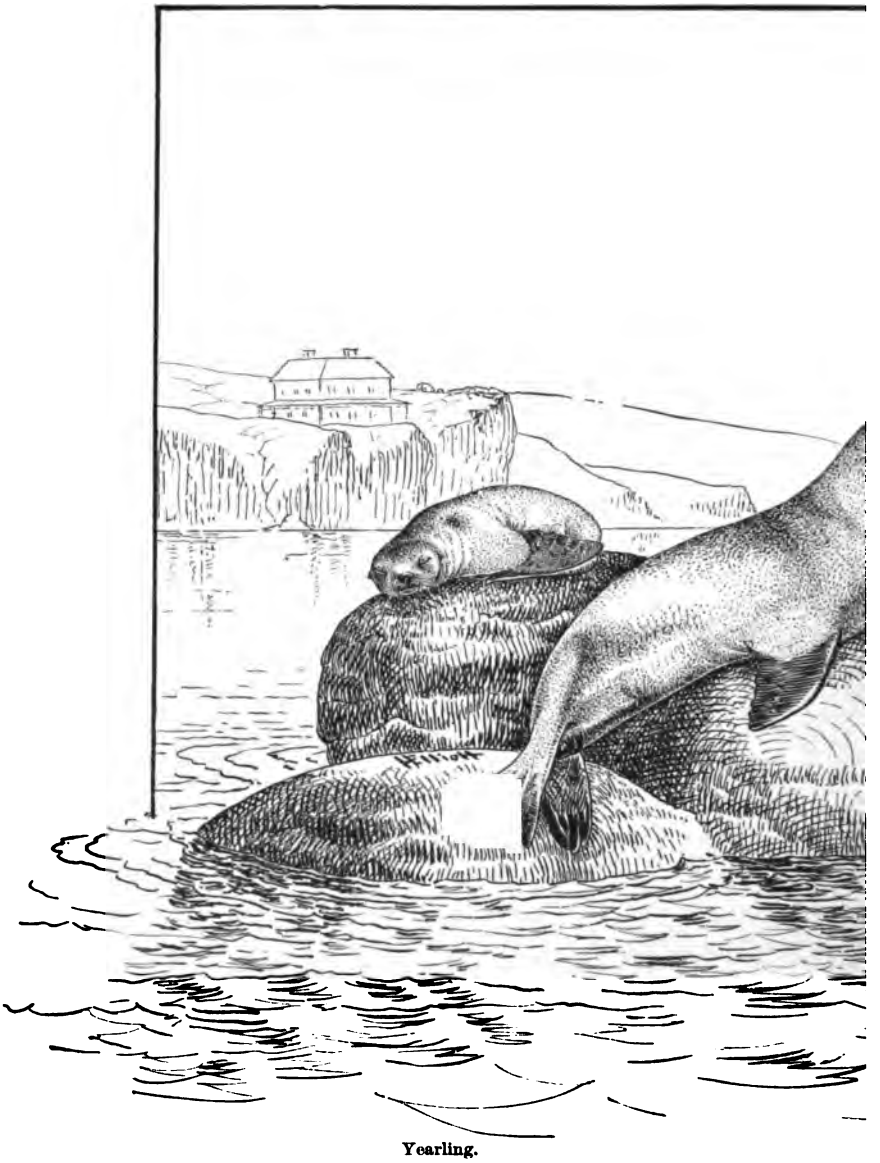
Plate XVII.



Yearling.

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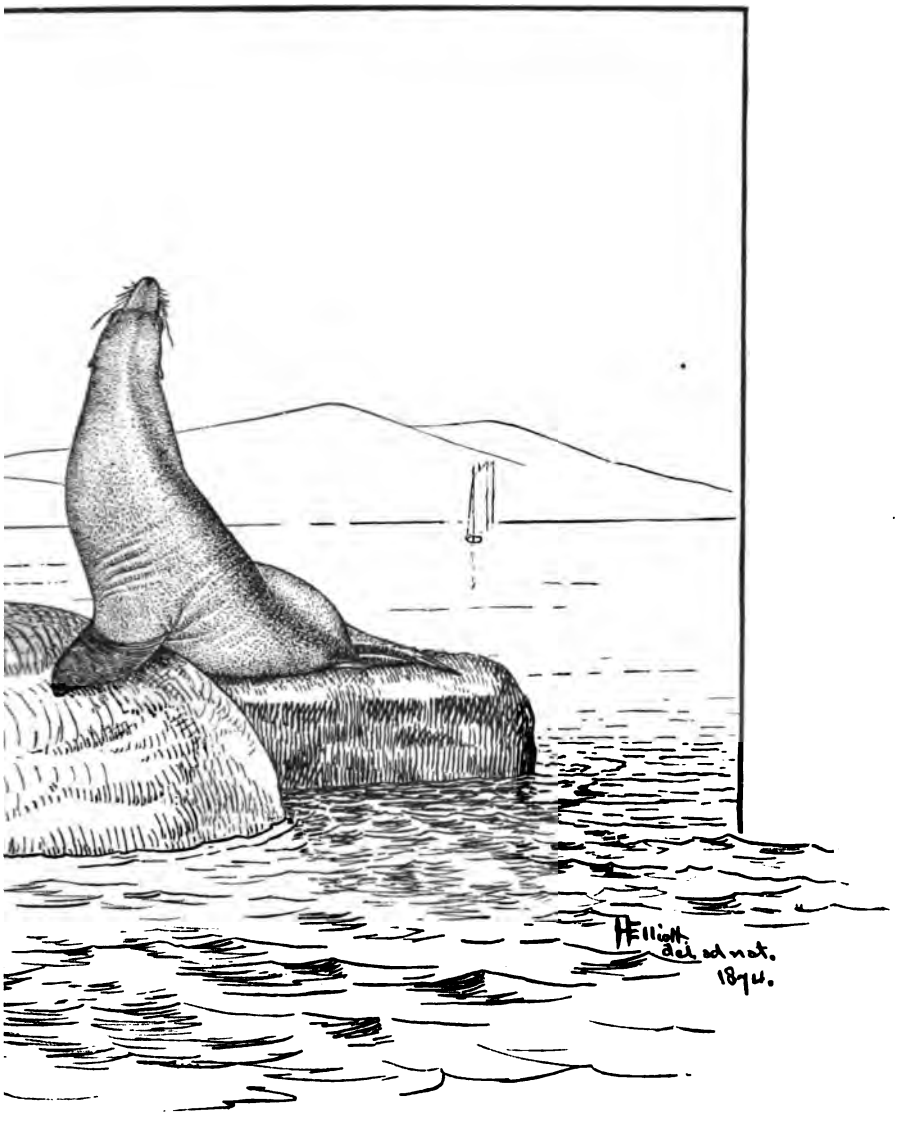
The author's life-studies of a four-year-old male. an adı



Female.

A-LION.

spii.)

earling, at San Francisco, Cal. (Woodward's Gardens).

turb and drive off any portion of the rookery, by walking up in plain sight, those nearest to you will take to the water, instantly swim out to a distance of 50 yards or so, leaving their pups behind, helplessly sprawled around and about the rocks at your feet. Huddled up all together in the water, in two or three packs or squads, the startled parents hold their heads and necks high out of the sea, peering keenly at you, and all roaring in an incessant concert, making an orchestra to which those deep, sonorous tones of the organ in that great Mormon tabernacle at Salt Lake City constitute the fittest and most adequate resemblance.

MOVEMENTS WHEN UNDISTURBED ON ROOKERY.—You will witness an endless tide of these animals traveling to the water and a steady stream of their kind coming out if you but keep in retirement and do not disturb them. When they first issue from the surf they are a dark, chocolate brown and black, and glisten; but as their coats dry off the color becomes an iron gray, passing into a bright, golden rufous, which covers the entire body alike—shades of darker brown on the pectoral patches and sterno-pectoral region. After getting entirely dry they seem to grow exceedingly uneasy, and act as though oppressed by heat until they plunge back into the sea, never staying out, as the fur seal does, day after day and week after week. The females and the young males frolic in and out of the water, over rocks awash, incessantly one with another, just as puppies play upon the greensward, and when weary stretch themselves out in any attitude that will fit the character of the rock or the lava shingle upon which they may happen to be resting. The movements of their supple spines and ball-and-socket joint attachments permit of the most extraordinary contortions of the trunk and limbs, all of which, no matter how distressing to your eyes, they seem actually to relish. But the old battle-scarred bulls of the harem stand or lie at their positions day and night without leaving them, except to take a short bath when the coast is clear, until the end of the season.

METHOD OF SWIMMING.—When swimming, the sea lion only lifts its head above the surface long enough to take a deep breath, and then drops down a few feet below and propels itself for about ten or fifteen minutes like a cigar steamer at the rate of 6 or 7 knots, if undisturbed, but if chased or alarmed, it seems fairly to fly under water, and can easily maintain for a long time a speed of 14 or 15 miles per hour. Like the fur seal, its propulsion through the water is the work entirely of the powerful fore flippers, which are simultaneously struck out, both together, and back against the water, feathering forward again to repeat, while the hind flippers are simply used as a rudder oar in deflecting the ever-varying swift and abrupt course of the animal. On land the hind flippers are employed just as a dog does his feet in scratching fleas, the long peculiar toe nails thereof seeming to reach and comb the spots affected by vermin, which annoys them, as it does the fur seal, to a great extent, and causes them both to enjoy a protracted scratching.

Again, both genera—*Callorhinus* and *Eumetopias*—are happiest when the surf is strongest and wildest. Just in proportion to the fury of a gale, so much the greater joy and animation of these animals. They delight in riding on the crests of each dissolving breaker up to the moment when it fairly foams over the iron-bound rocks. At that instant they disappear like phantoms beneath the creamy surge, to reappear on the crown of the next mighty billow.

When landing, they always ride on the surf, so to speak, to the

objective point, and it is marvelous to see with what remarkable agility they will worm themselves up steep, rocky landings, having an inclination greater than 45 degrees, to those bluff tops above, which have an almost perpendicular drop to water.

THE VALUE OF THE SEA LION, COMMERCIALLY: SHEDDING.—As the sea lion is without fur, its skin has little or no commercial value.[1] The hair is short, an inch to an inch and a half in length, being longest over the nape of the neck, straight and somewhat coarse, varying in color as the season comes and goes. For instance, when the *Eumetopias* makes its first appearance in the spring, and dries out after landing, it has then a light-brownish rufous tint, with darker shades back and under the fore flippers and on the abdomen. By the expiration of a month or six weeks—about the 15th of June generally—this coat will be weathered into a glossy rufous, or ocher, and this is soon before shedding, which sets in by the middle of August, or a little earlier. After the new coat has fairly grown, and just before the animal leaves the island for the sea in November, it is a light sepia or vandyke brown, with deeper shades, almost black, upon the abdomen. The cows after shedding never color up so darkly as the bulls, but when they come back to the land next year they return identically the same in tinting, so that the eye, in glancing over a sea-lion rookery during June and July, can not discern any dissimilarity in color at all noteworthy existing between the coats of the bulls and the cows; and also the young males and yearlings appear in the same golden brown and ocher, with here and there an animal which is noted as being spotted somewhat like a leopard, the yellow rufous ground predominating, with patches of dark brown, blotched and mottled, irregularly interspersed over the anterior regions down to those posterior. I have never seen any of the old bulls or cows thus mottled, and this is likely due to some irregularity of shedding in the younger animals, for I have not noticed it early in the season, and it seems to fairly fade away so as not to be discerned on the same animal at the close of its summer solstice. Many of the old bulls have a grizzled or "salt and pepper" look during the shedding period, which is from the 10th of August up to the 10th or 20th of November. The pups when born are a rich, dark, chestnut-brown. This coat they shed in October and take one much lighter in its stead, still darker, however, than their parents.

ARRIVAL AT AND DEPARTURE FROM THE PRIBILOF ISLANDS.—The time of arrival at, stay on, and departure from the islands is about the same as that which I have recorded as characteristic of the fur seal; but if the winter is an open, mild one, some of the sea lions will frequently be seen about the shores during the whole year; and then

[1] The sea lion and hair seals of Bering Sea, having no commercial value in the eyes of civilized men, have not been subjects of interest enough to the pioneers of those waters for mention in particular—such record, for instance, as that given of the walrus, the sea otter, and the fur seal. Steller was the first to draw the line clearly between them and seals in general, especially defining their separation from the fur seal; still, his description is far from being definite or satisfactory in the light of our present knowledge of the animal. In the South Pacific and Atlantic the sea lion has been curiously confounded by many of the earliest writers with the sea elephant—*Macrorhinus leoninus*—and its reference is inextricably entangled with the fur seal at the Falklands, Kerguelens Land, and the Crozettes. The proboscidean seal, however, seems to be the only pinniped which visits the Antarctic continent: but that is a mere inference of mine, because so little is known of those ice-bound coasts, and Wilkes, who gives the only record made of the subject, saw no other animal there save this one.

the natives occasionally shoot them long after the fur seals have entirely disappeared.

GREAT RANGE OF SEA LIONS: IT IS NOT RESTRICTED TO THE SEAL ISLANDS.—Again, it does not confine its landing to the Pribilof Islands alone, as the fur seal unquestionably does, with reference to such terrestrial location in our own country. On the contrary, it is a frequent visitor to almost all of the Aleutian Islands, and ranges, as I have said before, over the mainland coast of Alaska, south of Bristol Bay, and about the Siberian shores to the westward, throughout the Kuriles and the Japanese northern waters.[1]

DIFFERENCES BETWEEN ZALOPHUS AND EUMETOPIAS.—When I first returned, in 1873, from the seal islands, those authors whose conclusions were accepted prior to my studies there had agreed in declaring that the sea lion, so common off the port of San Francisco, was the same animal also common in Alaska, and the Pribilof Islands in especial; but my drawings from life, and studies, quickly pointed out the error, for it was seen that the creature most familiar to the Californians was an entirely different animal from my subject of study on the seal islands. In other words, while scattered examples of the *Eumetopias* were, and are, unquestionably about and off the harbor of San Francisco, yet nine-tenths of the sea lions there observed were a different animal—they were the *Zalophus californianus*. This *Zalophus* is not much more than half the size of *Eumetopias*, relatively; it has the large, round, soft eye of the fur seal, and the more attenuated Newfoundland-dog-like muzzle; and it never roars, but breaks out incessantly with a *honk*, *honk*, *honking* bark, or howl.

No example of *Zalophus* has ever been observed in the waters of Bering Sea, nor do I believe that it goes northward of Cape Flattery.

[1] The winter of 1872–73, which I passed on the Pribilof Islands, was so rigorous that the shores were ice bound and the sea covered with floes from January until the 28th of May; hence I did not have an opportunity of seeing for myself whether the sea lion remains about its breeding grounds there throughout that period. The natives say that a few of them, when the sea is open, are always to be found, at any day during the winter and early spring, hauled out at Northeast Point, on Otter Island, and around St. George. They are, in my opinion, correct; and being in such small numbers the "seevitchie" undoubtedly find enough subsistence in local crustacea, pisces, and other food. The natives also further stated that none of the sea lions which we observe on the islands during the breeding season leave the waters of Bering Sea from the date of their birth to the time of their death. I am also inclined to agree with this proposition, as a general rule, though it would be strange if Pribilof sea lions did not occasionally slip into the North Pacific, through and below the Aleutian chain, a short distance, even to traveling as far to the eastward as Cooks Inlet. *Eumetopias stelleri* is well known to breed at many places between Attu and Kadiak islands. I did not see it at St. Matthew, however, and I do not think it has ever bred there, although this island is only 200 miles away to the northward of the seal islands—too many polar bears. Whalers speak of having shot it in the ice packs in a much higher latitude, nevertheless, than that of St. Matthew. I can find no record of its breeding anywhere on the islands or mainland coast of Alaska north of the fifty-seventh parallel or south of the fifty-third parallel of north latitude. It is common on the coast of Kamchatka, the Kurile Islands, and the Commander group, in Russian waters.

There are vague and ill-digested rumors of finding *Eumetopias* on the shores of Prince of Wales and Queen Charlotte islands in breeding rookeries. I doubt it. If it were so, it would be authoritatively known by this time. We do find it in small numbers on the Farralone rocks, off the entrance to the harbor of San Francisco, where it breeds in company with, though sexually apart from, an overwhelming majority of *Zalophus;* and it is creditably reported as breeding again to the southward, on the Santa Barbara, Guadaloupe, and other islands of southern and Lower California, consorting there, as on the Farralones, with an infinitely larger number of the lesser-bodied *Zalophus*.

EARLY DISPOSITION OF SEA LIONS ON ST. GEORGE.—According to the natives of St. George, some fifty or sixty years ago the *Eumetopias* held almost exclusive possession of the island, being there in great numbers, some two or three hundred thousand strong; and they aver, also, that the fur seals then were barely permitted to land by these animals, and in no great number; therefore, they say, that they were directed by the Russians (that is, their ancestry) to hunt and worry the sea lions off from the island, the result being that, as the sea lions left, the fur seals came, so that to-day they occupy nearly the same ground which the *Eumetopias* alone covered sixty years ago. I call attention to this statement of the people because it is, or seems to be, corroborated in the notes of a French naturalist and traveler, who, in his description of the island of St. George, which he visited fifty years ago, makes substantially the same representation;[1] but directly to the contrary, and showing how difficult it is to trace these faint records of the facts, I give the account as rendered by Bishop Veniaminov, which I translate and place in my appendix. The reader will notice that the Russian author differs entirely from the natives and the Frenchman; for, by his tabulation, almost as many fur seals were taken on St. George during the first years of occupation as were taken from St. Paul; and according to these figures, again continued, the catch never has been less than one-sixth of the number of the quota on the larger island. Thus the two authors seem to stand each other off, and I am thrown back to the ground itself for an answer, which I am inclined to believe will be correct, when I say that the island of St. George never was resorted to in any great numbers by the fur seal, and that the sea lion was the dominant animal there until disturbed and driven from its breeding grounds by the people, who naturally sought to encourage its more valuable relative by so doing, and made room, in this way, for it.

CAPTURE OF THE SEA LION.

THE DRIVING ON ST. PAUL.—The great intrinsic value to the domestic service of the Aleuts rendered by the flesh, fat, and sinews of this animal, together with its skin, arouses the natives of St. Paul and St. George, who annually make a drive of "seevitchie," by which they capture, on the former island, two or three hundred, as the case may be. On St. George driving is so much more difficult, owing to the character of the land itself, that very few are secured there; but at St. Paul unexceptional advantages are found on Northeast Point for the capture of these shy and wary brutes. The natives of St. Paul, therefore, are depended upon to secure the necessary number of skins required by both islands for their boats and other purposes. This capture of the sea lion is the only serious business which the people have on St. Paul. It is a labor of great care, industry, and some physical risk for the Aleutian hunters.[2]

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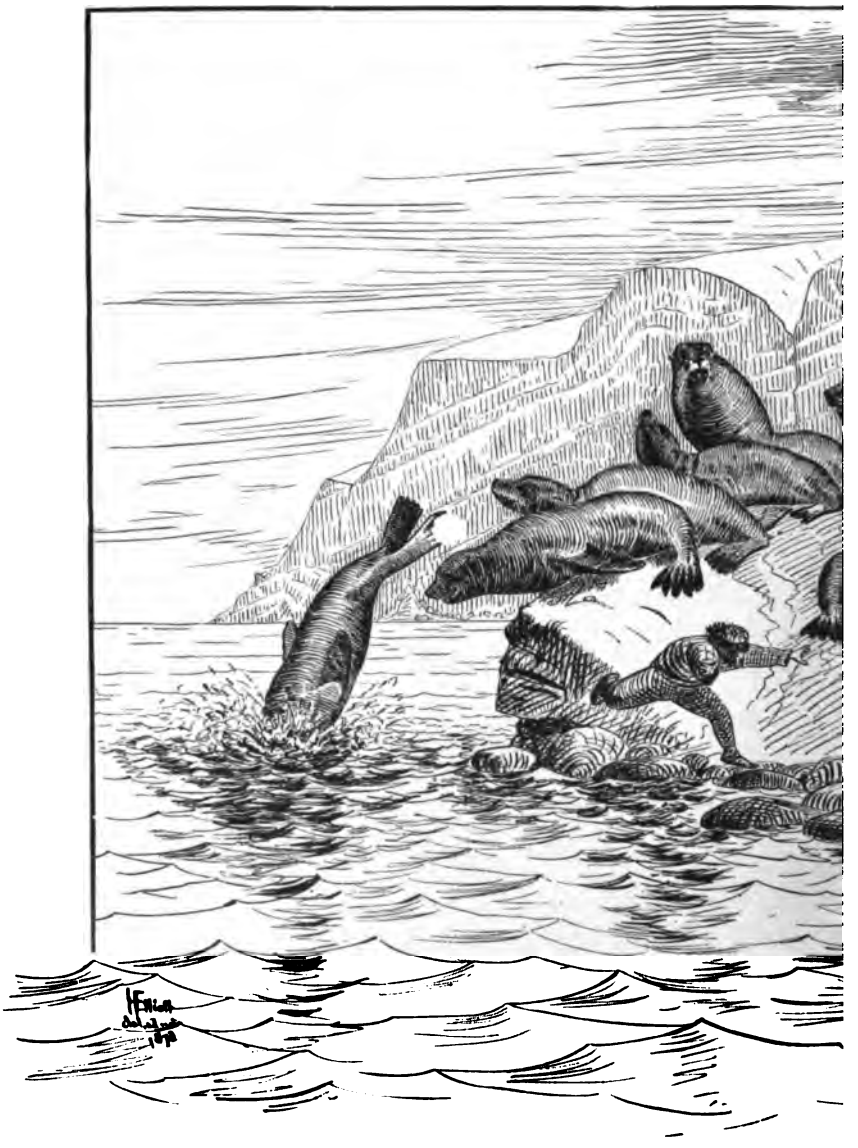
[1] Choris: Voyage Pittoresque autour du Monde.

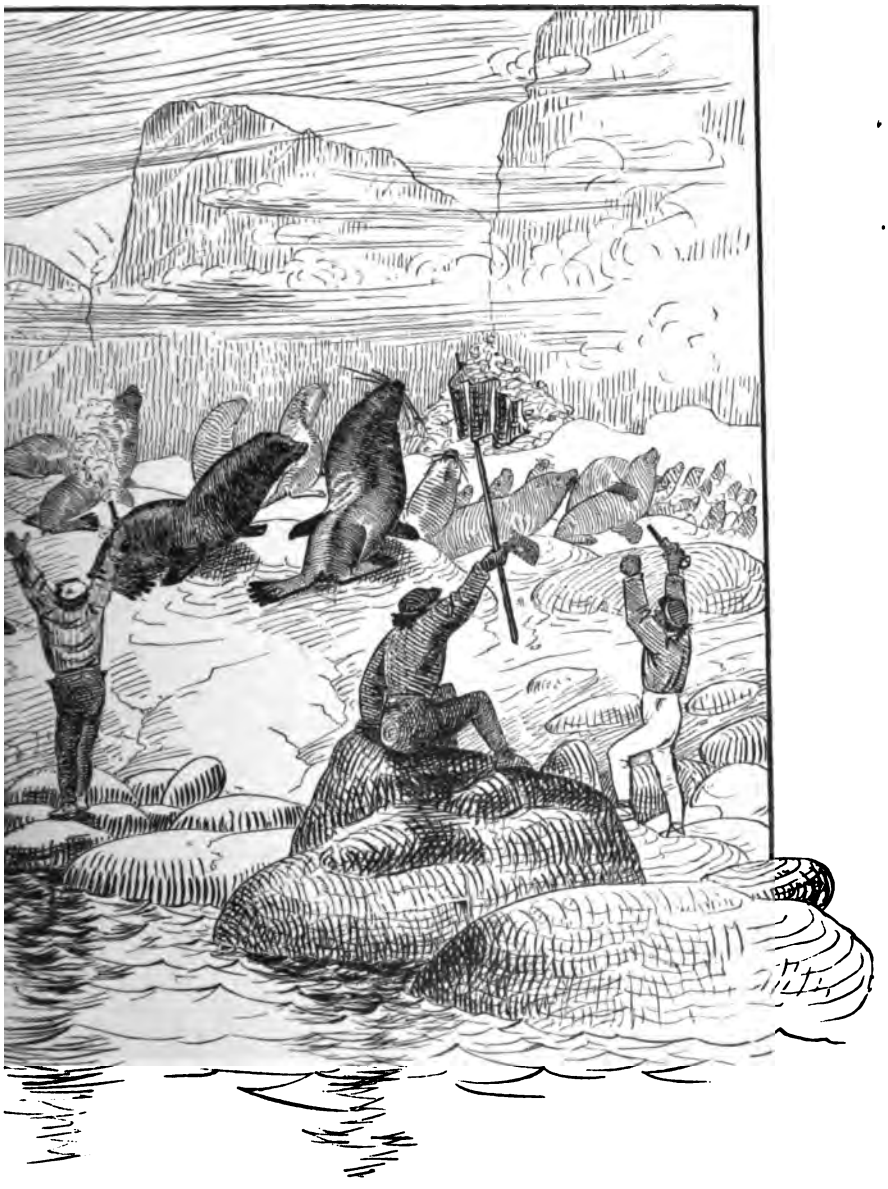
[2] A curious, though doubtless authentic, story was told me in this connection, illustrative of the strength and energy of the sea-lion bull when at bay. Many years ago (1847), on St. Paul Island, a drive of September sea lions was brought down to the village in the usual style; but when the natives assembled to kill them, on account of the great scarcity at that time of powder on the island, it was voted best to lance the old males also, as well as the females, rather than shoot them in the customary style. The people had hardly set to work at the task when one of their number a small, elderly, though tough, able-bodied Aleut, while thrusting his lance into the "life" of a large bull, was suddenly seen to fall on his

Plate X VIII.



SPRING

Natives capturing Sea-lion



ALARM.

ias Stelleri), Pribylov Islands.

By reference to my sketch map of Northeast Point rookery, the observer will notice a peculiar neck or boot-shaped point, which I have designated as Sea Lion Neck. This area is a spot upon which a large number of sea lions are always to be found during the season. As they are so shy, and sure to take to water upon the appearance or presence of man near by, the natives adopt this plan:

PREPARATIONS FOR THE DRIVE.—Along by the middle or end of September, as late sometimes as November, and after the fur-seal rookeries have broken up for the season, 15 or 20 of the very best men in the village are selected by one of their chiefs for a sea-lion rendezvous at Northeast Point. They go up there with their provisions, tea and sugar, and blankets, and make themselves at home in the barrabara and houses, which I have located on the sketch map of Novastoshnah, prepared to stay, if necessary, a month, or until they shall get the whole drove together of two or three hundred sea lions.

METHODS OF DRIVING SEA LIONS.—The "seevitchie," as the natives call these animals, can not be approached successfully by daylight, so these hunters lie by, in this house of Webster's, until a favorable night comes along—one in which the moon is partially obscured by drifting clouds and the wind blows over them from the rookery where the sea lions lie. Such an opportunity being afforded, they step down to the beach at low water and proceed to creep on all fours over the surf-beaten sand and bowlders up to the dozing herd and between it and the high-water mark, where it rests. In this way a small body of natives, crawling along in Indian file, may pass unnoticed by the sea-lion sentries, which, doubtless in the uncertain light, see but confound the forms of their human enemies with those of seals. When the creeping Aleuts have all reached the strip of beach that is left bare by ebb tide, which is between the water and the unsuspecting animals, at a given signal from their crawling leader they all at once leap to their feet, shout, yell, brandishing their arms, and firing off pistols, while the astonished and terrified lions roar and flounder in all directions.

BEHAVIOR OF THE SEA LIONS WHEN SURPRISED.—If at the moment of surprise the brutes are sleeping with their heads pointed toward the water, they rise up in fright and charge straight on in that way directly over the men themselves; but if their heads have been resting at this instant pointed landward, up they rise and follow that course just as desperately, and nothing will turn them either one way or the other. Those sea lions which charged for the water are lost, of course;[1] but the natives promptly follow up the land-turned animal

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back directly under the huge brute's head; instantly the powerful jaws of the "seevitchie" closed upon the waistband, apparently, of the native, and lifting the yelling man aloft, as a cat would a kitten, the sea lion shook and threw him high into the air, away over the heads of his associates, who rushed up to the rescue and quickly destroyed the animal by a dozen furious spear thrusts, yet death did not loosen its clenched jaws in which were the tattered fragments of Ivan's clothing.

[1]The natives appreciate this peculiarity of the sea lion very keenly, for good and sufficient cause, though none of them have ever been badly injured in driving or "springing the alarm." I camped with them for six successive nights in September, 1872, in order to witness the whole procedure. During the several drives made while I was with them I saw but one exciting incident. Everything went off in the orthodox manner, as described in the text above. The exceptional incident occurred during the first drive of the first night, and rendered the natives so cautious that it was not repeated. When the alarm was sprung, old Luka Mandrigan

with a rare combination of horrible noises and demoniacal gesticulations until the first frenzied spurt and exertions of the terrified creatures so completely exhaust them that they fall panting, gasping, prone upon the earth, extended, in spite of their huge bulk and powerful muscles, helpless and at the mercy of their cunning captors, who, however, instead of slaying them as they lie, rudely rouse them up again and urge the herd along to the house in which they have been keeping this watch during the several days past.

THE "CORRAL."—Here, at this point, is a curious stage in the proceedings. The natives drive up to that Webster house the 25 or 30 or 40 sea lions, as the case may be, which they have just captured—they seldom get more at any one time—and keep them in a corral or pen right by the barrabara, on the flattened surface of a sand ridge, in the following comical manner: When they have huddled up the "pod" they thrust stakes down around it at intervals of 10 to 30 feet, to which strips of cotton cloth are fluttering as flags, and a line or two of sinew rope or thong of hide is strung from pole to pole around the group, making a circular cage, as it were. Within this flimsy circuit the stupid sea lions are securely imprisoned; and though they are incessantly watched by two or three men the whole period of caging and penning which I observed, extending over nine or ten days and nights, passed without a single effort being made by the "seevitchie" to break out of their flimsy bonds; and it was passed by these animals not in stupid quiescence, but in alert watchfulness; writhing, twisting, turning one upon and over the other.

By this method of procedure, after the lapse usually of two or three weeks, a succession of favorable nights will have occurred and the natives secure their full quota, which, as I have said before, is expressed by a herd of two or three hundred of these animals.

PREPARATION AND METHOD OF DRIVING TO THE VILLAGE.—The complement filled, the natives prepare to drive their herd back to the village, over the grassy and mossy uplands and intervening stretches of sand-dune tracts, fully 11 miles, preferring to take the trouble of prodding the clumsy brutes, wayward and obstinate as they are, rather than to pack their heavy hides in and out of boats, making in this way each sea lion carry its own skin and blubber down to the doors of their houses in the village. If the weather is normally wet and cold this drive or caravan of sea lions can be driven to the point of destination in five or six days; but should it be dry and warmer than usual three weeks and even longer will elapse before the circuit is traversed.

When the drive is started the natives gather around the herd on all sides, save the opening which they leave pointing to the direction in which they desire the animals to travel; and in this manner they escort and urge the "seevitchie" on to their final resting and slaughter near the village. The young lions and the females being much lighter than the males, less laden with fat or blubber, take the lead; for they

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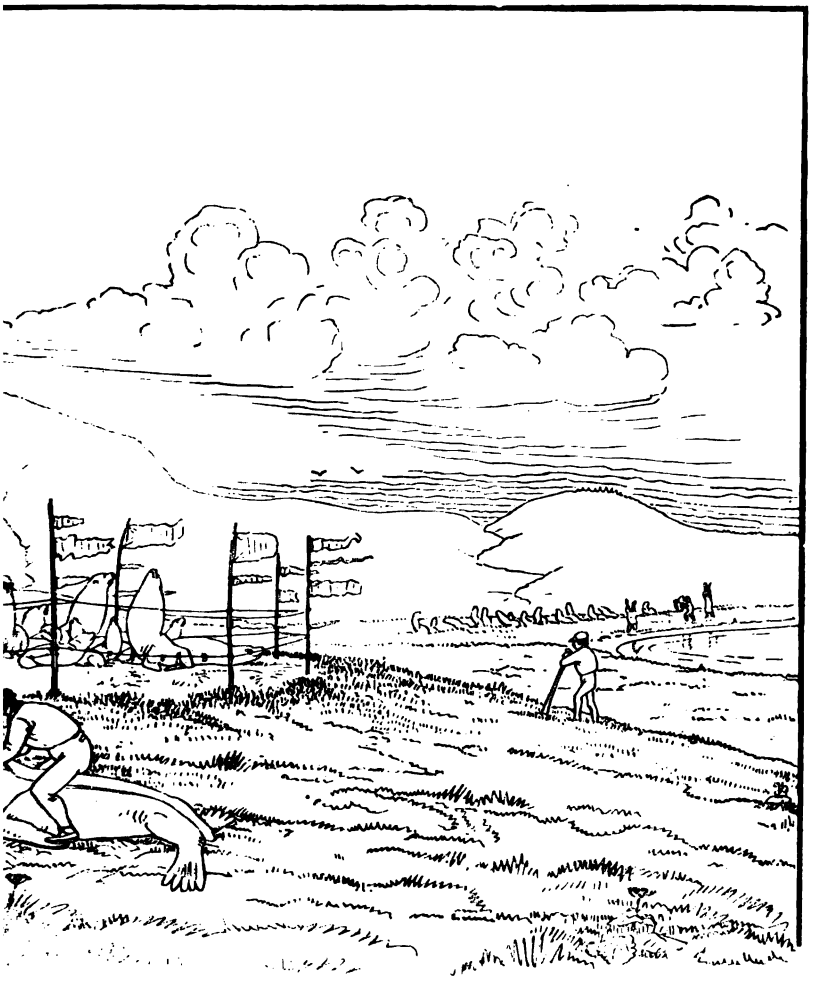
was leading the van, and at that moment, down upon him, despite his wildly gesticulating arms and vociferous yelling, came a squad of bull "seevitchie." The native saw instantly that they were pointed for the water, and in his sound sense turned to run from under. His tarbosar slipped upon a slimy rock awash, he fell flat as a flounder just as a dozen or more big sea lions plunged over and on to his prostrate form in the shallow water. In less time than this can be written, the heavy pinnepeds had disappeared, while the bullet-like head of old Luka was quickly raised, and he trotted back to us with an alternation of mirth and chagrin in his voice. He was not hurt in the least.

Plate XIX.

THE SI

Natives corralling Sea-lions at the Barrabora near Web



PEN.

use, under Cross Hill, Northeast Point, St. Paul Island.

travel twice and thrice as easy and as fast as the old males, which, by reason of their immense avoirdupois, are incapable of moving ahead more than a few rods at a time, when they are completely checked by sheer loss of breath, though the vanguard of the females allures them strongly on; but when an old sea lion feels his wind coming short he is sure to stop, sullenly and surlily turning upon the drivers, not to move again until his lungs are clear.

In this method and manner of conduction the natives stretch the herd out in extended file, or as a caravan, over the line of march, and as the old bulls pause to savagely survey the field and catch their breath, showing their wicked teeth, the drivers have to exercise every art and all their ingenuity in arousing them to fresh efforts. This they do by clapping boards and bones together, firing fusees, and waving flags; and, of late, and best of all, the blue gingham umbrella repeatedly opened and closed in the face of an old bull has been a more effective starter than all the other known artifices or savage expedients of the natives.[1]

ARRIVAL OF THE DRIVE AT THE VILLAGE.—The procession of sea lions managed in this strange manner day and night—for the natives never let up—is finally brought to rest within a stone's throw of the village, which has pleasurably anticipated for days and for weeks its arrival, and rejoices in its appearance. The men get out their old rifles and large sea-lion lances and sharpen their knives, while the

[1] The curious behavior of the sea lions in the Big Lake, when they are en route and driven from Novastoshnah to the village, deserves mention. After the drove gets over the sand dunes and beach between Webster's house and the extreme northeastern head of the lake, a halt is called and the drove "penned" on the bank there; then, when the sea lions are well rested, they are started up, and pell mell into the water; two natives, in a baidarka, keep them from turning out from shore into the broad bosom of Meesulkmahnee, while another baidarka paddles in their rear and follows their swift passage right down the eastern shore. In this method of procedure the drive carries itself nearly two miles by water in less than twenty minutes from the time the sea lions are first turned in, at the north end, to the moment when they are driven out at the southeastern elbow of the Big Pond. The shallowness of the water here accounts probably for the strange failure of the sea lions to regain their liberty, and so retards their swimming as to enable the baidarka, with two men, to keep abreast of their leaders easily, as they plunge ahead; and, "as one goes, so go all sheep," it is not necessary to pay attention to those which straggle behind in the wake; they are stirred up by the second baidarka, and none make the least attempt to diverge from the track which the swifter mark out in advance; if they did, they could escape "scot free" in any one of the twenty minutes of this aquatic passage.

By consulting the map of St. Paul it will be observed that in a direct line between the village and Northeast Point there are quite a number of small lakes, including this large one of Meesulkmahnee; into all these ponds the sea lion drove is successively driven; this interposition of fresh water at such frequent intervals serves to shorten the time of the journey fully ten days in warmish weather and at least four or five under the best of climatic conditions.

This track between Webster's house and the village killing grounds is strewn with the bones of *Eumetopias*. They will drop in their tracks, now and then, even when carefully driven, from cerebral or spinal congestion, principally; and when they are hurried the mortality en route is very great. The natives when driving them keep them going day and night alike, but give them frequent resting spells after every spurt ahead. The old bulls flounder along for a hundred yards or so, then sullenly halt to regain breath, five or ten minutes being allowed them; then they are stirred up again, and so on, hour after hour, until the tedious transit is completed.

The younger sea lions, and the cows which are in the drove, carry themselves easily far ahead of the bulls, and being thus always in the van, serve unconsciously to stimulate and coax the heavy males to travel. Otherwise, I do not believe that a band of old bulls, exclusively, could be driven down over this long road successfully.

women look well to their oil pouches, and repair to the field of slaughter with meat baskets on their heads.

MANNER IN WHICH THE KILLING IS CONDUCTED.—No attempt is made, even by the boldest Aleut, to destroy an old bull sea lion by spearing the enraged and powerful beast, which, now familiar with man and conscious, as it were, of his puny strength, would seize the lance between its jaws and shake it from the hands of the stoutest one in a moment. Recourse is had to the rifle. The herd is started up the sloping flanks of the Black Bluff hillside. The females speedily take the front, while the old males hang behind. Then the marksmen, walking up to within a few paces of each animal, deliberately draw their sights upon their heads and shoot them just between the eye and the ear. The old males thus destroyed, the cows and females are in turn surrounded by the natives, who, dropping their rifles, thrust the heavy iron lances into their trembling bodies at a point behind the fore flippers, touching the heart with a single lunge. It is an unparalleled spectacle, dreadfully cruel and bloody.[1]

ECONOMIC USES OF THE SEA LION.

HIGH APPRECIATION OF THE SEA LION BY THE ALEUTS.—Although the sea lion has little or no commercial value for us, yet to the service of the natives themselves, who live all along the Bering Sea coast of Alaska, Kamchatka, and the Kuriles, it is invaluable. They set great store by it. It supplies them with its hide, mustaches, flesh, fat, sinews, and intestines, which they make up into as many necessary garments, dishes, etc. They have abundant reason to treasure its skin highly, for it is the covering to their neat bidarkas and bidarrahs, the former being the small kyak of Bering Sea, while the latter is a boat of all work, exploration, and transportation. These skins are unhaired by sweating in a pile; then they are deftly sewed and carefully stretched over a light keel and frame of wood, making a perfectly water-tight boat that will stand, uninjured, the softening influence of water for a day or two at a time, if properly air dried and oiled. After being used during the day these skin boats are always drawn out on the beach, turned bottom side up, and air dried during the night; in this way made ready for employment again on the morrow.[2]

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[1] This surrounding of the cows is, perhaps, the strangest procedure on the islands. To fully appreciate the subject, the reader must first call to his mind's eye the fact that these female sea lions, though small beside the males, are yet large animals, 7 and 8 feet long and weighing, each, as much as any four or five average men. But in spite of their strength and agility fifteen or twenty Aleuts, with a rough, iron-tipped lance in their hands, will surround a drove of 50 or 150 of them by forming a noisy, gesticulating circle, gradually closing up, man to man, until the sea lions are literally piled in a writhing, squirming, struggling mass, one above the other, three or four deep, heads, flippers, bellies, backs all so woven and interwoven in this panic-stricken heap of terrified creatures that it defies adequate description. The natives spear the cows on top, which, as they sink in death, are mounted in turn by the live animals underneath. These meet the deadly lance in order, and so on until the whole herd is quiet and stilled in the fatal ebbing of their heart's blood.

[2] When slowly sketching, by measurements, the outlines of a fine adult bull sea lion which the ball from Booterin's rifle had just destroyed, an old "starooka" came up abruptly. Not seeming to see me, she deliberately threw down a large, greasy, skin meat bag, and, whipping out a knife, went to work on my specimen. Curiosity prompted me to keep still in spite of the first sensations of annoyance, so that I might watch her choice and use of the animal's carcass. She first removed the skin, being actively aided in this operation by an uncouth boy. She then cut off the palms to both fore flippers. The boy at the same time pulled out the mu-

VALUE OF THE INTESTINES.—A peculiar value is attached to the intestines of the sea lion, which, after skinning, are distended with air and allowed to dry in that shape. Then they are cut into ribbons and sewed strongly together into that most characteristic waterproof garment of the world, known as the "kamlaika,"[1] which, while being fully as waterproof as india rubber, has far greater strength and is never affected by grease and oil. It is also transparent in its fitting over dark clothes. The sea lions' throats are served in a similar manner, and, when cured, are made into boot tops, which are in turn soled by the tough skin that composes the palms of this animal's fore flippers.

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tache bristles. She then cut out its gullet from the glottis to its junction with the stomach, carefully divested it of all fleshy attachments and fat. She then cut out the stomach itself, and turned it inside out, carelessly scraping the gastric walls free of copious biliary secretions, the inevitable bunch of *ascaris*. She then told the boy to take hold of the duodenum end of the small intestine, and as he walked away with it she rapidly cleared it of its attachments, so that it was thus uncoiled to its full length of at least 60 feet. Then she severed it, and then it was recoiled by the "melchiska" and laid up with the other members just removed, except the skin, which she had nothing more to do with. She then cut out the liver and ate several large pieces of that workhouse of the blood before dropping it into the meat pouch. She then raked up several handfuls of the "leaf lard," or hard, white fat that is found in moderate quantity around the viscera of all these pinnipeds, which she also dumped into the flesh bag. She then drew her knife through the large heart, but did not touch it otherwise, looking at it intently, however, as it still quivered in unison with the warm flesh of the whole carcass. She and the boy then poked their fingers into the tumid lobes of the immense lungs, cutting out portions of them only, which were also put into the grimy pouch aforesaid. Then she secured the gall bladder and slipped it into a small yeast-powder tin, which was produced by the urchin. Then she finished her economical dissection by cutting the sinews out of the back in unbroken bulk from the cervical vertebra to the sacrum. All these were stuffed into that skin bag, which she threw on her back and supported it by a band over her head. She then trudged back to the barrabkie from whence she sallied a short hour ago like an old vulture to the slaughter. She made the following disposition of its contents: The palms were used to sole a pair of tarbosars, or native boots, of which the uppers and knee tops were made of the gullets—one sea-lion gullet to each boot top. The stomach was carefully blown up, and left to dry on the barrabkie roof, eventually to be filled with oil rendered from sea-lion or fur-seal blubber. The small intestine was carefully injected with water and cleansed, then distended with air, and pegged out between two stakes, 60 feet apart, with little cross slats here and there between to keep it clear of the ground. When it is thoroughly dry it is ripped up in a straight line with its length and pressed out into a broad band of parchment gut, which she cuts up and uses in making a waterproof "kamlaikia," sewing it with those sinews taken from the back. The liver, leaf lard, and lobes of the lungs were eaten without further cooking, and the little gall bag was for some use in poulticing a scrofulous sore. The mustache bristles were a venture of the boy, who gathers all that he can, then sends them to San Francisco, where they find a ready sale to the Chinese, who pay about 1 cent apiece for them. When the natives cut up a sea-lion carcass or one of a fur seal on the killing grounds for meat, they take only the hams and the loins. Later in the season they eat the entire carcass, which they hang up by the hind flippers on a "laabas" by their houses.

[1] The Aleutian name for this garment is unpronounceable in our language and equally so in the more flexible Russian; hence the Alaskan "kamlaika," derived from the Siberian "kamläia." That is made of tanned reindeer skin, unhaired, and smoked by larch bark until it is colored a saffron yellow, and is worn over the reindeer-skin undershirt, which has the hair next to the owner's skin and the obverse side stained red by a decoction of alder bark. The kamläia is closed behind and before and a hood, fastened to the back of the neck, is drawn over the head when leaving shelter; so is the Aleutian kamlaika; only the one of Kolyma is used to keep out piercing dry cold, while the garment of the Bering Sea is a perfect water repellant.

STOMACH WALLS USED AS OIL POUCHES.—Around the natives' houses on St. Paul and St. George constantly appear curious objects, which, to the unaccustomed eye, resemble overgrown gourds or enormous calabashes with attenuated necks. An examination proves them to be the dried, distended stomach walls of the sea lion, filled with its oil, which, unlike the offensive blubber of the fur seal, boils out clear and inodorous from its fat. The flesh of an old sea lion, while not very palatable, is tasteless and dry, but the meat of a yearling is very much like veal, and when properly cooked I think it is just as good; but the superiority of the sea-lion meat over that of the fur seal is decidedly marked. It requires some skill in the cuisine ere sausage and steaks of the *Callorhinus* are accepted on the table, while it does not, however, require much art, experience, or patience for the cook to serve up the juicy ribs of a young sea lion so that the most fastidious palate will fail to relish it.

CARING FOR THE FLESH.—The carcass of the sea lion, after it is stripped of its hide and disemboweled, is hung up in cool weather by its hind flippers over a rude wooden frame, or "labaas," as the natives call it, where, together with many more bodies of fur seals treated in the same manner, it serves from November until the following season of May as the meat house of the Aleut on St. Paul and St. George. Exposed in this manner to the open weather the natives keep their seal meat almost any length of time in winter for use, and, like our old duck and bird hunters, they say they prefer to have the meat tainted rather than fresh, declaring that it is most tender and toothsome when decidedly "loud."

CHINESE DEMAND FOR WHISKERS.—The tough, elastic mustache bristles of the sea lion are objects of great commercial activity by the Chinese, who prize them highly for pickers to their opium pipes and several ceremonies peculiar to their joss houses. The lip bristles of the fur seal are usually too small and too elastic for this service. The natives, however, always carefully pluck them out of the *Eumetopias* and get their full value in exchange.

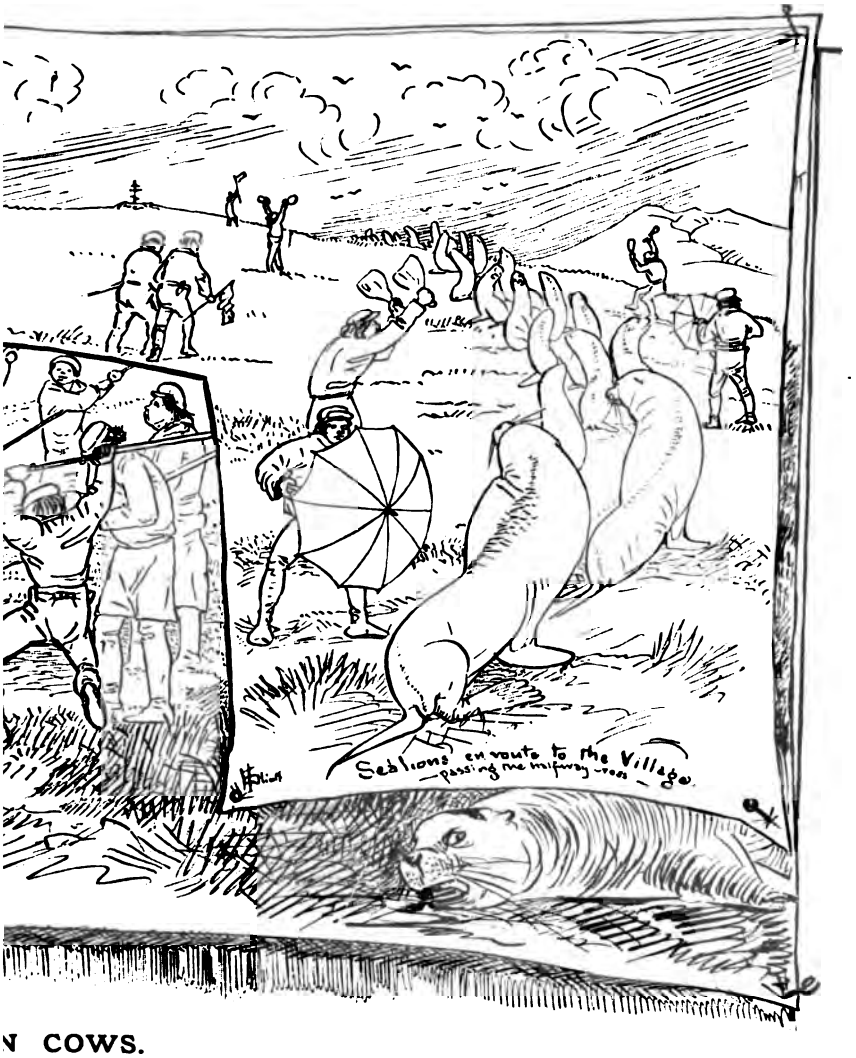
DIET OF THE SEA LION.—The sea lion also, as in the case of the fur seal, is a fish eater pure and simple, though he, like the latter, occasionally varies his diet by consuming a limited amount of juicy seaweed fronds and tender marine crustaceans; but he hunts no animal whatever for food, nor does he ever molest up here the sea fowl that incessantly hovers over his head or sits in flocks without fear on the surface of the waters around him. He, like the *Callorhinus*, is without question a mighty fisherman, familiar with every submarine haunt of his piscatorial prey, and, like his cousin, rejects the heads of all those fish which have hard, horny mouths, or are filled with teeth or bony plates.[1]

[1] Many authorities who are quoted in regard to the habits of the hair seals and southern sea lions speak with much fine detail of having witnessed the capture of sea fowl by *Phocidæ* and *Otariidæ*. To this point of inquiry on the Pribilof Islands I gave continued close attention, because off and around all of the rookeries large flocks of auks, arries, gulls, shags, and choochkies were swimming upon the water and shifting thereupon incessantly day and night throughout the late spring, summer, and early fall. During the four seasons of my observation I never saw the slightest motion made by a fur seal or sea lion, a hair seal, or a walrus toward intentionally disturbing a single bird, much less of capturing and eating it. Had these seals any appetite for sea fowl this craving could have been abundantly satisfied at the expense of absolutely no effort on their part. That none of these animals have any taste for water birds I am thoroughly assured.

Plate XX.

SPEARING THE

Natives bring the Sea-lion drove from



N COWS.

'oint. Shooting the old males.

LIFE HISTORY OF THE WALRUS.

VOLUMINOUS WRITINGS RELATIVE TO THE WALRUS.—When I first set out for the sea islands, from the Smithsonian Institution, in 1872, I fancied that, as far as the walrus was concerned, I should have nothing to learn, because of the literature on that subject which I had read from the Congressional Library, viz:

The curious histories written by Olaus Magnus, in 1555; by Gesner, in 1558; by Martens, in 1675; by Pennant, in 1781–1792; by Buffon, in 1785, and by Cuvier, in 1816, together with an almost innumerable list of authors who have since contributed papers on the walrus and its character to nearly all the learned associations of the world. With this imposing list of authorities in my mind, I thought I had reason to believe that there was nothing about this pinniped which I should find new, or even interesting to science.

THE WALRUS OF BERING SEA.—When, therefore, looking for the first time upon the walrus of Bering Sea, judge of my astonishment as I beheld the animal before me. It was a new species; it was a new creature, or all that had been written by five hundred authors in regard to the appearance and behavior of its Atlantic cousin was in error. The natives who accompanied me were hurriedly summoned to my side, called from their eager task of picking up birds' eggs. "Are these walrus sick?" said I. They looked at me in astonishment; "No; they are not." "Do they always look like that?" "Serovnah,"[1] was the answer.

Such was my introduction to *Rosmarus arcticus* (Pallas), and the occasion of my describing it in 1873, for the first time, as the walrus of Bering Sea—a distinct and separate animal, specifically, from its congener of the North Atlantic, *Odobœnus rosmarus* (Allen).[2]

WALRUS ON THE PRIBILOF ISLANDS.—In early days, when the Pribilof Islands were first occupied by the Russians, report has it that large numbers of these creatures frequented the entire coast line of St. Paul Island, and many were found around St. George; but, being relatively more timid than the sea lion in respect to the presence

[1] Just the same.

[2] Allen, in reviewing the history of this species, cites the hesitating opinions of Pennant, in 1792; of Shaw, in 1800; of F. Cuvier, in 1825; of Leidy, in 1860, all of whom suggest the specific distinctness of the Bering Sea walrus, but give their ideas clouded by expressed hints or mental reservations. He shows, however, that Illiger, in 1811, formally recognized three varieties, but that this author gives nowhere his reasons for so doing. He named them *Trichecus rosmarus* for the North Atlantic and *T. obesus* and *T. divergens* for the Bering Sea region and waters north of the straits thereof. Then Allen says, page 21, "I have met with nothing further touching this subject prior to Mr. H. W. Elliott's report on the seal islands of Alaska, published in 1873," and he quotes it freely. Professor Allen has, however, done the osteological part of the work so well in his History of North American Pinnipeds that now I deem it finished. While Allen agrees with me finally in my early determination of the Bering Sea walrus as a distinct species from that of the Atlantic, he seems to base all of his belief upon the osteological differentiation between them. I have had my faith in that one line of evidence as to genera and species so sadly shaken by the amazing asymmetry and differences in the skulls and skeletons of the fur seal which are bleaching out here side by side, thousands and tens of thousands of them, that I feel better satisfied with the characteristic external features of the pinnipeds, which are really more fixed and exact among the hundreds of thousands on the Pribilof Islands. Perhaps 10,000 skulls of *Odobœnus obesus* would show a great number of examples which could not alone by themselves be separated from types of *O. rosmarus*. From my inspection of the wide range of variation presented in a large series of *Callorhinus* and *Eumetopias* skulls, I do not have any hesitation in saying so.

of man, they rapidly disappeared as he took possession of the land. The disappearance, however, was not total—a few of them every year were and can now be observed upon that little rocky islet, lying 6 miles to the southeast of the Northeast Point of St. Paul Island, owing to its comparative isolation, since the natives only go there once a year, and then only for a few days during the egging season.[1]

SELECTION OF LANDINGS BY WALRUS HERDS.—The walrus rests upon the low rocky tables characteristic of this place, without being disturbed; hence the locality afforded me a particularly pleasant and advantageous opportunity of minutely observing these animals. My observations, perhaps, would not have passed over a few moments of general notice, had I found the picture presented by them such as I had drawn in my mind from the descriptions of the army of writers cited above; the contrary, however, stamping itself so suddenly and decidedly upon my eye, set me to work with pen and brush in noting and portraying the extraordinary brutes, as they lay grunting and bellowing, unconscious of my presence, and not 10 feet from the ledge upon which I sat.[2]

LIFE STUDIES OF THE HERD.—Sitting as I did to the leeward of them, a strong wind blowing at the time from seaward, which ever and anon fairly covered many of them with the foaming surf spray, they took no notice of me during the three or more hours of my study. I was first surprised at observing the raw, naked appearance of the hide, a skin covered with a multitude of pustular-looking warts and large boils or pimples, without hair or fur, save scattered and almost invisible hairs; the skin wrinkled in deep, flabby seam folds, and

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[1] As to the number of walrus on the Pribilof Islands in prehistoric time, and when the Russians first took possession of the same, 1786–87, I have not been able to find any record of the least authentic value. Beyond the general legend of the natives that in olden times the "morsjee" were wont to haul in considerable number at Novashtoshnah and over the entire extent of the north and south shores of St. Paul, while herds were also common under the precipitous sea walls of St. George. Gavrila Sarietschev, one of the several imperial agents commissioned at intervals to examine into the affairs of the old Russian-American Fur Company, in the details of his report made in December, 1805, incidentally states, speaking of the walrus, that while they had abandoned the Pribilof Islands then, yet formerly they were there in such numbers that 28,000 pounds of their teeth (tusks) were obtained in a single year. As the average weight of well-assorted walrus ivory is about 8 pounds to the head of each animal, this memorandum of the agent shows that between 3,500 and 4,000 walrus were taken then. From the quantity of old bones of *Rosmarii*, which are constantly covered and uncovered by the caprice of the wind at Nahsayvernia and Novastoshnah, I should judge the Russian officer was correct.

[2] These favored basaltic tables are also commented upon in similar connection by an old writer in 1775, Shuldham, who calls them "echouries;" he is describing the Atlantic walrus as it appears at the Magdalen Islands: "The echouries are formed principally by nature, being a gradual slope of soft rock, with which the Magdalen Islands abound, about 80 to 100 yards wide at the water side and spreading so as to contain near the summit a very considerable number." The tables at Walrus Island and those at Southwest Point are very much less in area than those described by Shuldham, and are a small series of low, sawtooth jetties of the harder basalt washed in relief from a tufa matrix. There is no room to the landward of them for many walruses to lie upon. The *Odobœnus* does not like to haul up on loose or shingly shores, because it has the greatest difficulty in getting a solid hold for its fore flippers with which to pry up and ahead its huge, clumsy body. When it hauls on a sand beach, it never attempts to crawl out to the dry region back of the surf, but lies just awash, at high water. In this fashion they used to rest all along the sand reaches of St. Paul prior to the Russian advent in 1786–87; and when Shuldham was inditing his letters on the habits of *Rosmarus*, *Odobœnus* was then lying out in full force and great physical peace on the Pribilof Islands.

marked by dark-red venous lines, which showed out in strong contrast through the thicker and thinner yellowish brown cuticle, that in turn seemed to be scaling off in places as if with leprosy. Indeed, a fair expression of this walrus-hide complexion, if I may use the term, can be understood by the inspection of those human countenances in the streets and on the highways of our cities which are designated as the faces of "bloats." The forms of *Rosmarus* struck my eye at first in the most unpleasant manner, and the longer I looked at them the more heightened was my disgust, for they resembled distorted, mortified, shapeless masses of flesh. The clusters of swollen, watery pimples, which were of yellow parboiled flesh color and principally located over the shoulders and around the necks, painfully suggested unwholesomeness.

On examining the herd individually, and looking over perhaps 150 specimens directly beneath and within the purview of my observation, I noticed that there were no females among them. They were all males, and some of the younger ones had considerable hair, or enough of that close, short, brown coat to give a hairy tone to their bodies—hence I believe that it is only the old, wholly matured males which offered to my eyes their bare and loathsome nakedness.

I observed, as they swam around and before they landed, that they were clumsy in the water, not being able to swim at all like the *Phocidæ* and the *Otaridæ;* but their progress in the sea was wonderfully alert when brought into comparison with that terrestrial action of theirs. The immense bulk and weight of this walrus, contrasted with the size and strength of its limbs, renders it simply impotent when hauled out of the water, and on the low rocky beaches or shelves upon which it rests. Like the seal, however, it swims entirely under water when traveling, but it does not rise, in my opinion, so frequently to take breath; when it does, it blows or snorts not unlike a whale. Often I have noticed this puffing snort of these animals, since the date of these observations on Walrus Islet, when standing on the bluffs near the village of St. Paul and looking seaward. On one cool, quiet morning in May, especially, I followed with my eye a herd of walrus, tracing its progress some distance off and up along the east coast of the island very easily by the tiny jets of moisture or vapor from the confined breath which the animals blew off as they rose to respire.[1]

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[1] Mariners, while coasting in the Arctic, have often been put on timely footing by the walrus fog horn snorting and blowing when a ship dangerously sails silently in through dense fog toward land or ice floes, upon which these animals may be resting; indeed, these uncouth monitors to this indistinct danger rise and bob under and around a vessel like so many gnomes or demons of fairy romance; and the sailors may well be pardoned for much of the strange yarning which they have given to the reading world respecting the sea horse during the last three centuries; but when we find Albert Magnus, and Gesner the sage, talking in the following extraordinary manner of the capture of *Rosmarus*, we are constrained to laugh heartily; especially do we so, because a more shy, timid brute than the walrus of Bering Sea never existed when he is hunted by man, unless it be the sea otter.

Says Gesner in 1558: "Therefore these fish called *Rosmarii* or *Morsii*, have heads fashioned like to an oxe, and a hairy skin, and hair growing as thick as straw or corn-reeds, that lie loose very largely. They will raise themselves with their teeth, as by ladders, to the very tops of rocks that they may feed upon the dewie grasse, or fresh water, and role themselves in it, and then go to the sea again, unless in the meantime they fall very fast asleep, and rest upon the rocks, for then the fishermen make all the haste they can and begin at the tail, and part the skin from the fat; and into this that is parted they put most strong cords, and fasten them on the rugged rocks or trees that are near; and then they throw stones at his head, out of a sling, to raise him, and they compel him to descend spoiled of the greatest part of his skin which is fastened to the ropes; he being thereby debilitated, fear-

METHODS OF LANDING: CLUMSY EFFORTS.—In landing and climbing over the low, rocky shores at Morserovia,[1] this animal is fairly as clumsy and almost as indolent as the sloth. A herd crowds up from the water, one after the other, in the most ungainly manner, accompanying their movements with low grunts and bellowings; the first one up from the sea no sooner gets composed upon the rocks for sleep than the second one comes along, prodding and poking with its blunted tusks, demanding room also, and causes the first to change its position to another location still farther off and up from the water, a few feet beyond; then the second is in turn treated in the same way by a third, and so on until hundreds will be slowly packed together on the shore, as thickly as they can lie, never far back from the surf, however, pillowing their heads upon the bodies of one another, and not acting at all quarrelsome toward each other. Occasionally, in their lazy, phlegmatic adjusting and crowding, the posteriors of some old bull will be lifted up, and remain elevated in the air, while the passive owner sleeps with its head, perhaps, beneath the pudgy form of its neighbor.

USE OF TUSKS.—A great deal has been written in regard to the manner in which the walrus uses his enormous canines; many authors have it that they are employed by *Rosmarus* as landing hooks, so that by sticking them into the icy floes, or inserting them between rocky interstices or inequalities, the clumsy brute aids his hauling out from the sea. I looked here at Walrus Island very closely for such mani-

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ful and half dead, he is made a rich prey, especially for his teeth, that are very pretious amongst the *Scythians*, the *Muscovites*, *Russians* and Tartars (as ivory amongst the Indians) by reason of its hardness, whiteness and ponderousnesse."

In spite of the many remarkable and well authenticated stories printed as to the ferocity of the Atlantic walrus when hunted, it can be safely said that no boat has ever been assailed by the Alaskan species, which is as large if not larger, and in every respect quite as able bodied. The Eskimo capture them without danger or difficulty—mere child's play or woman's work—spearing and lancing. By spearing, a line of walrus hide is made fast to the plethoric body of *Rosmarus*, and when it has expended its surplus vitality by towing the natives a few miles in a mad frenzied burst of swimming, the bidarrah is quietly drawn up to its puffing form, close enough to permit the coup of an ivory-headed lance, then towed to the beach at high water. When the ebb is well out the huge carcass is skinned by its dusky butchers, who cut it up into large square chunks of flesh and blubber, which are deposited in the little "Dutch-oven" caches of each family that are waiting for its reception.

Dressing the walrus hides is the only serious hard labor which the Alaskan Innuit subjects himself to. He can not lay it entirely upon the women, as do the Sioux when they spread buffalo bodies all over the plains. It is too much for female strength alone, and so the men bear a hand right lustily in the business. It takes from four to six stout natives when a green walrus hide is removed to carry it to the sweating hole, where it is speedily unhaired. Then stretched alternately upon air frames and pinned over the earth, it is gradually scraped down to the requisite thinness for use in covering the bidarrah skeletons, etc.

There are probably six or seven thousand human beings in Alaska who live alone by virtue of the existence of *Rosmarus*, and every year when the season opens they gather together by settlements, as they are contiguous, and discuss the walrus chances for the coming year as earnestly and as wisely as our farmers do, for instance, regarding the prospects for corn and potatoes. But the Eskimo hunter is a sadly improvident mortal, though he is not wasteful of morse life; while we are provident and yet wasteful of our resources.

If the north pole is ever reached by our people, they will do so only when they can eat walrus meat and get plenty of it. At least, that is my belief, and knowing now what the diet is, I think the journey to the hyperborean ultima is a long one, though there is plenty of meat and many men who want to try it.

[1] Morserovia, the Russian name for Walrus Island; the natives also call Otter Island by the Russian title of Bobrovia.

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Plate XXI.

THE WALRUS O

(Rosmarus

A life-study of an old male by the a

RING SEA.

ıs.)

lrus Island, July 5, 1872.

festation of their service to the members of the herd, which was continually augmented by fresh arrivals from the surf while under my eye. They did not in a single instance use their tusks in this manner; it was all done by the fore flippers, and "boosting" of exceptionally heavy surf which rolled in at wide intervals, and for which marine assistance the walrus themselves seemed to patiently wait.[1]

With all this apparent indifference, however, they have established their reputation for vigilance in spite of it; and they resort to a very singular method of keeping guard, if I may so term it. In this herd of three or four hundred male walrus that were under my eyes, though nearly all were sleeping, yet the movement of one would disturb the other, which would raise its head in a stupid manner for a few moments, grunt once or twice, and before lying down to sleep again it would strike the slumbering form of its nearest companion with its tusks, causing that animal to rouse up in turn for a few moments also, grunt, and pass the blow on to the next, lying down in the same manner. Thus the word was transferred, as it were, constantly and unceasingly around, always keeping some one or two aroused, which consequently were more alert than the rest.

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[1] I have seen no description of this Pacific walrus which is as good as is the first notice of it ever made to English readers, by Captain Cook, in his Last Voyage. It is, as far as it goes, precisely in accordance with my views of the same animal, nearly a century later, viz, July, 1872. He said: "They lie in herds of many hundreds upon the ice, huddling one over the other like swine, and roar or bay very loud, so that in the night or in foggy weather they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep, some being always on the watch. These, on the approach of the boat, would wake those next to them, and the alarm being thus gradually communicated, the whole herd would be awake presently. But they were seldom in a hurry to get away till after they had once been fired at, when they would tumble one over the other into the sea in the utmost confusion, and if we did not at the first discharge kill those we fired at we generally lost them, though mortally wounded. They did not appear to be that dangerous animal some authors have described, not even when attacked. They are rather more so to appearance than in reality. Vast numbers of them would follow, and some come close up to the boats; but the flash of a musket in the pan, or even the bare pointing of one at them, would send them down in an instant. The female will defend the young one to the very last, and at the expense of her own life, whether in the water or upon the ice. Nor will the young one quit the dam though she be dead; so that if you kill one you are sure of the other. The dam, when in the water, holds the young one between her fore fins." (Cook's Voyages to the Pacific Ocean, 1778, etc., vol. II, p. 458. London, 1785.)

I do not wish to appear in the light of desiring to detract one iota from that credit of accurate description which so justly belongs to Cook; but he himself did not indicate that he thought the Pacific walrus a distinct species from its Atlantic congener. His figure of the Bering Sea *Rosmarus* is entirely grotesque. A human face with beard, a thin neck, and immensely inflated posteriors, and fore flippers divided up into distinct fingers, make a creature as totally unlike *Odobœnus obesus* as need be; yet naturalists have gravely spoken of it as "excellent!" Had Captain Cook possessed the same explicit and graphic power of description in his pencil that characterizes his pen, I know full well that this caricature above referred to (Cook's Voyage to the Pacific Ocean, etc., 1776–1780, vol. II, pl. LII) would never have appeared.

The pinnipeds are, perhaps, of all animals, the most difficult subjects that the artist can find to reproduce from life. There are no angles or elbows to seize hold of—the lines of the body and limbs are all rounded, free, and flowing; yet the very fleshiest examples never have that bloated, wind-distended look which most of the figures published give them. One must first become familiarized with the restless, varying attitudes of these creatures, by extended personal contact and observation, ere he can satisfy himself with the result of his drawings, no matter how expert he may be in rapid and artistic delineation. Life studies, by artists, of the young of the Atlantic walrus have been made in several instances, but of the mature animal there is nothing extant of that character.

HELPLESSNESS ON LAND.—In moving on land they do not seem to have any physical power in the hind limbs; these are usually dragged and twitched up behind, or feebly flattened out at right angles to the body; terrestrial progression is slowly and tediously made by a dragging succession of short steps forward on the fore feet; but if the alarm is given it is astonishing to note the contrast which they present in their method of getting back to sea; they fairly roll and hustle themselves over and into the waves.

How long they remain out from the water in this country I am unable to say; but, stored up as they are with such an enormous supply of surplus fat, dull and sluggish in temperament, I should think that they could sustain a fasting period equal to that of the *Otariidæ*, if not superior to them in endurance.

These adult males before me looked very much larger than I expected to find the walrus,[1] and it was fortunate for the accuracy and good sense of these notes now published, that one of the natives kindly volunteered to shoot any of the bulls which I might select, after I should have finished my sketching and writing. I therefore, when my drawings were completed, selected the largest animal in the group; and promptly at my signal a rifle ball crashed into the skull at the only place where it could enter, just on the line of the eye and the ear, midway between them.

GREAT SIZE OF THE WALRUS.—This animal, thus slain, certainly was the largest one of the entire herd, and the following measurements and notes can therefore be relied upon: It measured 12 feet 7 inches from its bluff nostrils to the tip of its excessively abbreviated tail, which was not more than 2½ or 3 inches long; it had the surprising girth of 14 feet. The immense mass of blubber on the shoulders and around the neck made the head look strangely small in proportion and the posteriors decidedly attenuated; indeed, the whole weight of the animal was bound up in its girth anteriorly. It was a physical impossibility for me to weigh this brute, and I therefore can do nothing but make a guess, having this fact to guide me, that the head, cut directly off at the junction with the spine, or the occipital or atlas joint, weighed 80 pounds; that the skin, which I carefully removed with the aid of these natives, with the head, weighed 570 pounds. Deducting the head and excluding the flippers, I think it is safe to say that the skin itself would not weigh less than 350 pounds, and the animal could not weigh much less than a ton—from 2,000 to 2,200 pounds.

CHARACTERISTICS OF HEAD.—The head has a decided flattened appearance, for the nostrils, eyes, and ear spots seem to be placed

[1] The most satisfactory result that I can obtain from a careful study of what is on record as to the length of the adult male Atlantic walrus is a mean of 10 feet 7 inches, while my observations on Walrus Island give the Bering Sea male adult walrus an average of 11 feet. The only two examples which I measured were both over this figure, viz, 11 feet 9 inches and 12 feet 7 inches, from tip of muzzle to the skinny nodule or excrescence, scientifically known as the tail; but they were striking exceptions in superior size to all the others in the large herd of old males before my eyes at the time, and were singled out for shooting on that score. I fully realize this, because in July, 1874, when I revisited Walrus Island, I caused a younger male, and one tolerably well haired over with a very dark brown and short coat to be shot. When measured it gave a length of only 10 feet 9 inches, and would not weigh, in my best estimation, more than 1,200 to 1,500 pounds. It was, however, fully matured. Thus the "greater size" which I recognized in 1872 means an increased length of 5 or 6 inches to the Alaska form, with a relative greater avoirdupois. The complete and uniform unhairing of the old Alaskan male *Odobœnus* is another very characteristic feature in different expression from Atlantic herds.

nearly on top of the cranium; the nasal apertures are literally so, opening directly over the muzzle; they are oval, and closed parallel with the longitudinal axis of the skull, and when dilated are about an inch in their greatest diameter.

The tusks or canines are set firmly under the nostril apertures in deep, massive, bony pockets, giving that strange, broad, square-cut front of the muzzle so characteristic to the physiognomy.

The upper lips of the walrus of Bering Sea are exceedingly thick and gristly, and the bluff, square muzzle is studded in regular rows and intervals with a hundred or so short, stubby, gray-white bristles, varying in length from one-half to 3 inches. There are a few very short and much softer bristles set also on the fairly hidden chin of the lower jaw, which closes up under the projecting snout and muzzle and is nearly concealed by the enormous tushes when laterally viewed.

PECULIARITIES OF THE EYES.—The eyes are small, but prominent, placed nearly on top of the head, and, protruding from their sockets, bulge like those of the lobster. The iris and pupil of this eye is less than one-fourth of the exposed surface; the sclerotic coat swells out from under the lids when they are opened, and is of a dirty, mottled, coffee yellow and brown, with an occasional admixture of white; the iris itself is light brown, with dark-brown rays and spots. I noticed that whenever the animal aroused itself, instead of turning its head it rolled its eyes about, seldom moving the cranium more than to elevate it. The eyes seem to move, rotating in every direction when the creature is startled, giving the face of this monster a very extraordinary attraction, especially when studied by an artist. The expression is just indescribable. The range of sight enjoyed by the walrus out of water, I can testify, is not well developed, for after throwing small chips of rock down upon the walruses near me, several of them not being 10 feet distant, and causing them only to stupidly stare and give vent to low grunts of astonishment, I then rose gently and silently to my feet, standing boldly up before them; but then even I was not noticed, though their eyes rolled all over from above to under me. Had I, however, made a little noise, or had I been standing as far as 1,000 yards away from them to the windward, they would have taken the alarm instantly and tumbled off into the sea like so many hustled wool sacks, for their sense of smell is of the keen keenest.

ACUTE HEARING.—The ears of the walrus, or rather the auricles to the ears, are on the same lateral line at the top of the head with the nostrils and eyes, the latter being just midway between. The pavilion, or auricle, is a mere fleshy wrinkle or fold, not at all raised or developed; and, from what I could see of the meatus externus, it was very narrow and small. Still the natives assured me that the *Otariidæ* had no better organs of hearing than "Morsjee."

LOOSE SETTING OF THE TUSKS.—The head of the male walrus, to which I have alluded, and from which I afterwards removed the skin, was 18 inches long between the nostrils and the post-occipital region; and although the enormous tusks seemed to be so firmly planted in their osseous sockets, judge of my astonishment when one of the younger natives flippantly struck a tusk with a wooden club quite smartly, and then easily jerked the tooth forth. I had frequently observed that it was difficult to keep the teeth from rattling out of their alveoli in any of the best skulls I had gathered of the fur seals and sea lions; especially difficult in the case of the latter. But again, on this interesting subject of dentition, it is best that I refer to Dr. Allen. Repetition of his admirable diagnosis is unnecessary here.

UNUSUAL THICKNESS OF THE SKIN.—The thickness of the hide[1] of the walrus is, after all, in my opinion, its most anomalous feature. I remember well how surprised I was when I followed the incision of the broadax used in beheading the specimen shot for my benefit, to find that the skin over the shoulders and around the throat and chest was 3 inches thick—a puffy, spongy epidermis, outward hateful to the sight, and inwardly resting upon the slightly acrid fat or blubber so characteristic of this animal. Nowhere is this hide, upon the thinnest point of measurement, less than half an inch thick. It feeds exclusively upon shellfish (*Lamellibranchiata*), or clams principally, and also upon the bulbous roots and tender stalks of certain marine plants and grasses which grow in great abundance over the bottoms of broad, shallow lagoons and bays of the main Alaskan coast. I took from the paunch of the walrus above mentioned more than a bushel of crushed clams in their shells, all of which that animal had evidently just swallowed, for digestion had scarcely commenced. Many of those clams in that stomach, large as my clenched hands, were not even broken; and it is in digging this shellfish food that the services rendered by the enormous tusks become apparent.[2]

COWARDICE OF THE WALRUS OF BERING SEA.—It may not accord with the singular tales told, on the Atlantic side, about the uses of these gleaming ivory teeth, so famous and conspicuous; but I believe that the Alaskan walrus employs them solely in the labor of digging clams and rooting bulbs from those muddy oozes and sand bars in the estuary waters peculiar to his geographical distribution. Certainly, it is difficult for me to reconcile the idea of such uncouth, timid

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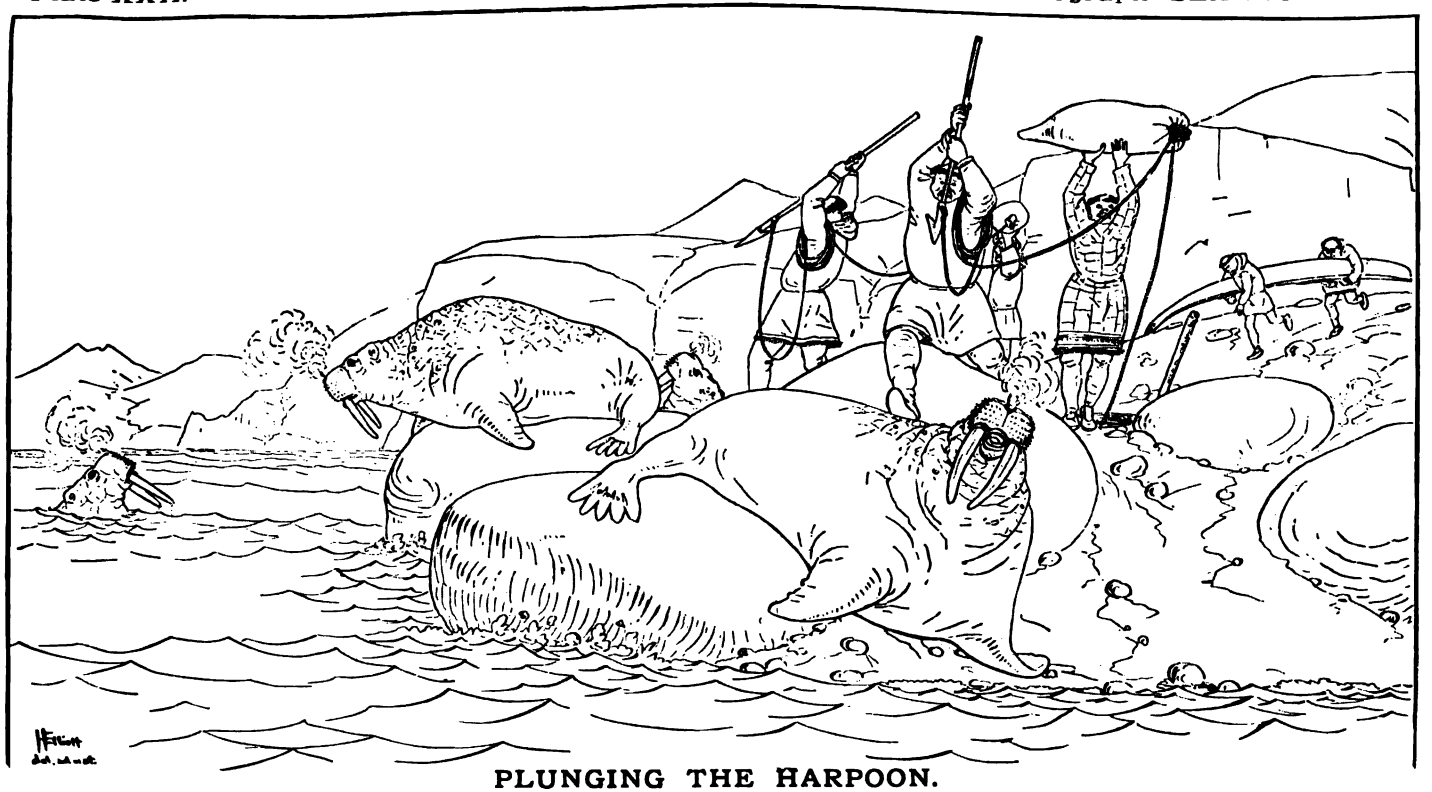
[1] While savage man has utilized the tough hide of *Rosmarus* and *Obesus*, the skin was also used by the Russians themselves to cover the packages of furs sent from Sitka to Kiachta, China; the skin was there stripped and again sewed anew over the chests of tea that were received in exchange for these furs thus enveloped, and which were carried hence to Moscow. Here the soundest portions of the hide remaining on the boxes were finally cut up and stamped into "kopecks" and a variety of small change, in time, to revisit its native seas used as a circulating medium, for value received, throughout all Alaska where the Russians held power. A leather currency was long known to that country, and old Philip Volkov, of St. Paul, told me that he never saw silver or gold coin used on the seal islands until our people brought it in 1868. These walrus parchment rubles were worth much less than their face value—sometimes only one-third. The Russians also made harness out of walrus leather. As long as the weather remained cold and dry the wear of this material was highly satisfactory, but woe to the "kibitscha" if caught out in a rain storm. The walrus harness then stretches like india rubber, and the horses fairly leave the vehicle far behind, sticking in the road, though the traces are unbroken.

[2] It is, and always will be, a source of sincere regret to me and my friends that I did not bodily preserve this huge paunch and its contents. It would have filled a half barrel very snugly, and then its mass of freshly swallowed clams (*Mya truncata*), filmy streaks of macerated kelp, and fragments of crustaceans, could have been carefully examined during a week of leisure at the Smithsonian Institution. It was, however, ripped open so quickly by one of the Aleuts, who kicked the contents out, that I hardly knew what had been done ere the strong-smelling subject was directly under my nose. The natives then were anxious that I should hurry through with my sketches, measurements, etc., so that they might the sooner push off their egg-laden bidarrah and cross back to the main island before the fogs would settle over our homeward track, or the rapidly rising wind shift to the northward and imperil our passage. Weighty reasons, these, which so fully impressed me that this unique stomach of a carnivora was overlooked and left behind; hence, with the exception of curiously turning over the clams (especially those uncrushed specimens), which formed the great bulk of its contents, I have no memoranda or even distinct recollection of the other materials that were incorporated. The olivaceous green color of its soft, pasty excrement must be derived from eating *chlorospermæ* and divers branches of algoid growth.



PLUNGING THE HARPOON.

Innuits of St. Lawrence Island, Alaska, making fast to Walruses surprised by the Eskimo while hauled up on the sea-beaches at Kagallegak.

brutes, as were those spread before me on Walrus Islet, with any of the strange chapters written as to the ferocity and devilish courage of the Greenland morse. These animals were exceeding cowardly; abjectly so. It is with the greatest difficulty that the natives, when a herd of walruses are surprised, can get a second shot at them; so far from clustering attacks around their boats, it is the very reverse; and the hunter's only solicitude is which way to travel in order that he may come up with the fleeing animals as they rise to breathe. Again, I visited Walrus Islet in 1874, accompanied by Lieutenant Maynard, United States Navy, and the captain of the revenue cutter *Reliance*. We rowed from the ship directly toward the islet, to a point where we saw the accustomed and expected sight of walrus lying thereon. The wind was fair for us and we came up almost to within a boat's oar distance of the dozing, phlegmatic herd. One was singled out, and Captain Baker shot it—his first walrus; the whole herd, as usual, hustled with terrible energy into the water, and all around our boat, for we had not landed, and they did not rise about or near us to give one snort of defiance, or to give us the faintest suggestion of any disposition to attack us, but they disappeared unpleasantly soon—too quickly.

ABSENCE OF FEMALES ON WALRUS ISLAND.—As I have said before, there are no females on this island, and I can therefore say nothing about them; I regret it exceedingly. On questioning the natives, as we returned, they told me that the walrus of Bering Sea was monogamous; and that the difference between the sexes in size, color, and shape is inconsiderable; or, in other words, that until the males are old, the young males and the females of all ages are not remarkably distinct, and would not be at all if it were not for the teeth; they said that the female brings forth her young, a single calf, in June, usually, on the ice floes in the Arctic Ocean, above Bering Straits, between Point Barrow and Cape Seartze Kammin; that this calf resembles the parent in general proportions and color when it is hardly over six weeks old, but that the tusks (which give it its most distinguishing expression) are not visible until the second year of its life; that the walrus mother is strongly attached to her offspring,[1] and nurses it later through the season in the sea; that the walrus sleeps profoundly in the water, floating almost vertically, with barely more than the nostrils above water, and can be easily approached if care is taken as to the wind, so as to spear it or shove a lance into its bowels; that the bulls do not fight as savagely as the fur seal or the sea lion; that the blunted tusks of these combatants seldom do more than bruise their

[1] That the sea lion and the fur seal should be so apathetic when danger to their young arises, and that the clumsy, timid walrus fights for their protection to the death under the same circumstances, is somewhat strange. According to all reports which I can gather from reputable authority, notably Captain Cook's brief, yet explicit, account, the walrus never deserts its young in that manner, hitherto described, so characteristic of the *Otariidæ* of Bering Sea. This odd contrast in behavior is worthy of further attention, as far as the walrus is concerned. There were no females or young among the herds of *Rosmarus* which I observed at Walrus Island, hence I am unable myself to give any facts based upon life studies.

The reported affection and devotion of the mother walrus seems only natural, being, as it is, the rule throughout all the higher grades of mammalia, while this attitude of the sea lion and fur seal is decidedly opposed to it; and were it not that it was so plainly presented in a thousand and one cases to my senses, I should have seriously doubted its correctness. Still, the best authority that I can recognize on the habits of the *Phocidæ*, Kumlein, says that the hair seals all display the same indifference which I portray in this respect as characteristic of the fur seal and sea lion. (Kumlein: Contributions to the Natural History of Arctic America. Bull. U. S. National Museum, Washington, p. 59, 1879.)

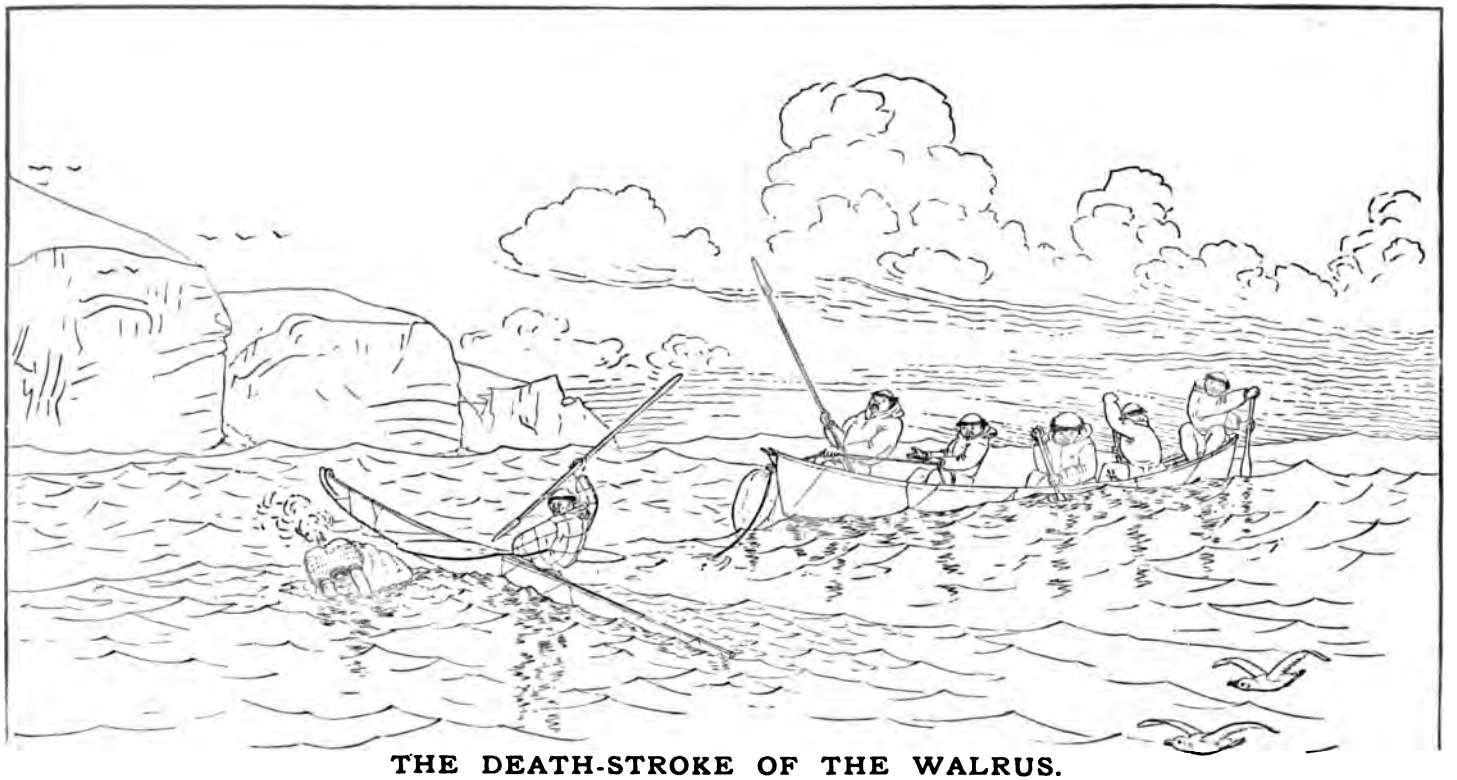
thick hides; that they can remain under water nearly an hour, or about twice as long as the seals; and that they sink like so many stones, immediately after being shot at sea.[1]

FIRST RECORD OF THE OCCURRENCE OF FEMALES.—The reason why this band of males, and many of them old ones, should be here to the exclusion of females throughout the year is not plain. The natives assured me that walrus females or their young never have been seen around the shores of these islands, but I have trustworthy advices from the village of St. Paul, at the date of this publication, declaring the fact of the capture of a female on Walrus Islet last fall, the first one ever recorded.

GEOGRAPHICAL DISTRIBUTION OF THE WALRUS OF ALASKA.—The walrus has, however, a very wide range of distribution in Alaska, though not near so great as in prehistoric times.[2] They abound to the eastward and southeastward of St. Paul, over in Bristol Bay, where great numbers congregate on the sand bars and flats, now flooded, now

[1] I personally made no experiments touching the peculiarity of sinking immediately after being shot. Of course on reflection it will appear to any mind that all seals, no matter how fat or how lean, would sink instantly out of sight if not killed at the stroke of the bullet. Even if mortally wounded, the great involuntary impulse of brain and muscle would be to dive and speed away, for all swimming is submarine when the pinnipeds desire to travel. Touching this mooted question, I had an opportunity when in Port Townsend, during 1874, to ask a man who had served as a partner in a fur-sealing schooner off the Straits of Fuca. He told me that unless the seal was instantly killed by the passage of the rifle bullet through its brain it was never secured, and would sink before they could reach the bubbling wake of its disappearance. If, however, the aim of the marksman had been correct, then the body was invariably taken within five to ten minutes after the shooting. Only one man did the shooting. All the rest of the crew, ten to twelve white men and Indians, manned canoes and boats, which were promptly dispatched from the schooner, after each report, in the direction of the shooting. How long one of the bodies of these "clean" killed seals would float he did not know. The practice always was to get it as quickly as possible, fearing that the bearings of its position when shot from the schooner might be confused or lost. He also affirmed that in his opinion there were not a dozen men on the whole northwest coast who were good enough with a rifle and expert at distance calculation to shoot fur seals successfully from the deck of a vessel on the ocean. The Indians of Cape Flattery get most of the pelagic fur seals by cautiously approaching from the leeward when they are asleep and throwing line darts or harpoons into them before they awaken.

[2] I have been frequently questioned whether, in my opinion, it was more than a short space of time ere the walrus was exterminated or not, since the whalers had begun to hunt them in Bering Sea and the Arctic Ocean. To this I frankly make answer that I do not know enough of the subject to give correct judgment. The walrus spend most of their time in waters that are within reach of these skillful and hardy navigators; and if they (the walrus) are of sufficient value to the whaler he can, and undoubtedly will, make a business of killing them and work the same sad result that he has brought about with the mighty schools of cetacea which once whistled and bared their backs throughout the now deserted waters of Bering Sea, in perfect peace and seclusion, prior to 1842. The returns of the old Russian America Company show that an annual average of 10,000 walrus have been slain by the Eskimo since 1799 up to 1867. There are a great many left yet. But unless the oil of *Rosmarus* becomes very precious, commercially, I think the shoal waters of Bristol Bay and Kuskokwim mouth, together with the eccentric tides thereof, will preserve it indefinitely. Forty years ago, when the North Pacific was the rendezvous of the greatest whaling fleet that ever floated, those vessels could not, nor can they now, approach nearer than 60 or even 80 miles of the muddy shoals, sands, and bars upon which the walrus rest there, scattered in herds of a dozen or so in numbers up to bodies of thousands, living in lethargic peace and almost unmolested, except in several small districts which are carefully hunted over by the natives of Ugashik for oil and ivory. I have been credibly informed that they also breed in Bristol Bay and along the coast as far north as Cape Avinova, during some seasons of exceptional rigor in the Arctic.



THE DEATH-STROKE OF THE WALRUS.

Eskimo lancing the exhausted Walrus, St. Lawrence Island.

Mahlemoot dress, bidarka, baidar, etc., of Alaska.

bared by the rising and ebbing of the tide. They are hunted here to a considerable extent for their ivory. No walrus are found south of the Aleutian Islands. Still, not more than forty-five or fifty years ago, small gatherings of these animals were killed here and there on the islands between Kadiak and Unimak Pass. The greatest aggregate of them south of Bering Straits will always be found in the estuaries of Bristol Bay and on the north side of the peninsula.

PREHISTORIC RANGE OF THE WALRUS.—Geologists find the record of the great ice period well filled up by the range of the walrus, then, as far down on the Atlantic Coast as the littoral margins of South and North Carolina, and its fossil remains are common in the diluvial deposits of England and France, while the phosphate beds of New Jersey are exceedingly rich in old walrus bones. But within historic times there is no evidence that points to the existence of the walrus on the New England coast. During the last half of the sixteenth century they are known to have frequented the southern confines of Nova Scotia. That hardy navigator, James Cartier, tells us in his quaint vernacular that in May, 1534, he met at the island of "Ramea" (probably Sable Island), sporting in the sea, "very greate beastes, as greate as oxen, which have two greate teeth in their mouths like unto Elephant's teeth, & live also in the Sea. We saw them sleeping on the banke of the water; wee, thinking to take it, went with our boates, but so soon as he heard us he caste himselfe into the sea." Another old salt, "Thomas James, of Bristoll," speaking of the same subject shortly after, says, "the fish cometh on banke (to do their kind) in April, May, and June, by numbers of thousands, which fish is very big, and hath two great teeth; and the skin of them is like Beeffes leather; and they will not away from their yong ones. The yong ones are as good meat as Veale. And with the bellies of five of the saide fishes they make a hogshead of Traine, which Traine is very sweet, which, if it will make sope, the King of Spaine may burne some of his Olive trees." (!) This spice of Yankee enterprise in "sope," evidently, did not come to a successful head.[1]

THE WALRUS "BIDARRAH."—The finest bidarrah skin boats of transportation that I have seen in this country were those of the St. Lawrence natives. These were made out of dressed walrus hides, shaved and pared down by them to the requisite thickness so that, when they were sewed with sinews to the wooden whalebone-lashed frames of these boats, they dried into a pale, greenish white prior to oiling, and were even then almost translucent, tough, and strong.

USES OF WALRUS HIDES.—Until I saw the bidarrahs of the St. Lawrence natives in 1874, I was more or less inclined to believe that the tough, thick, and spongy hide of the walrus would be too refractory in dressing for use in covering such light frames, especially those of the bidarka; but the manifest excellence and seaworthiness of these Eskimo boats satisfied me that I was mistaken. I saw, however, abundant evidence of the much greater labor required in tanning or

[1] I depart from the Pacific walrus, for a moment, in thus speaking of its Atlantic brother with reference to the testimony of the rocks as to its limit of southern range north of the equator. For the thought of herds of walrus floating down on immense frigid floes over the present lowlands of Virginia and North Carolina, and of Anvers and near Paris, France, is an interesting one, relative to the features of the great ice age. Down they came, that is certain. Van Beneden and Leidy have recently figured their aged bones as they are silicified or cast in the marls of those southern coasts and interiors. (See Leidy, Trans. Am. Phil. Soc., xi, 1860, Philadelphia. Van Beneden: Des de Oss. Foss. des Envirns d'Anvers; Annales Mus. d'Hist. Nat. de Belgique, 1877, tome I, pp. 40–41.) No such bones have as yet been found on the northwest coast or in Alaska.

paring down the thick cuticle to that thin, tough transparency so marked on their bidarrahs, for the pelt of the hair seal or sea lion does not require any more attention when applied to this service than simply unhairing it. This is done by first sweating the "loughtak" in piles, then rudely but rapidly scraping, with blunt knives or stone flensers, the hair off in large patches at every stroke; the skin is then air dried, being stretched on a stout frame, where, in the lapse of a few weeks, it becomes as rigid as a board. When required for use thereafter it is soaked in water until soft or "green" again, then it is sewed with sinews, while in this fresh condition, tightly over the slight wooden skeleton of the bidarka or the heavier frame of the bidarrah. In this manner the skin boats and lighters at the islands are covered; then they are air dried thoroughly before oiling, which is done when the skin has become well indurated, so as to bind the ribs and keel as with an iron plating; the thick, unrefined seal oil keeps the water out for twelve to twenty hours, according to the character of the hides. When, however, the skin covering begins to "bag in" between the ribs of the frame, then it is necessary to haul the bidarrah out and air dry it again and reoil it. If attended to thoroughly and constantly those skin-covered boats are the best species of lighter which can be used at these islands, for they will stand more thumping and pounding on the rocks and alongside ship than all wooden or even corrugated iron lighters could endure and remain seaworthy.

MANNER OF DRESSING WALRUS AND SEA-LION HIDES.—I noticed that the St. Lawrence Eskimo pared the walrus hide down from the outer surface or hairy side, while at St. Paul, when it became necessary to reduce the thickness of a sea lion's skin at spots around the neck and shoulders, the paring was done on the fleshy side. Very little thinning, however, was needed in the case of sea-lion "loughtak."[1]

[1] When I stepped for the first time into the baidar of St. Paul Island and went ashore from the *Alexander*, over a heavy sea, safely to the lower bight of Lukannon Bay, my sensations were of emphatic distrust. The partially water-softened skin covering would puff up between the wooden ribs and then draw back as the waves rose and fell, so much like an unstable support above the cold green water below, that I frankly expressed my surprise at such an outlandish craft. My thoughts quickly turned to a higher appreciation of those hardy navigators who used these vessels in circumpolar seas years ago, and the Russians who, more recently, employed bidarrahs chiefly to explore Alaskan and Kamtchatkan terra incognita. There is an old poem in Avitus, written by a Roman as early as 445 A. D., which describes the ravages of Saxon pirates along the southern coasts of Britain, who used just such vessels as is this bidarrah of St. Paul:

> Quin et armoricus piratim Saxona tractus
> Spirabat, cui pelle falum fulcare Britannum
> Ludus, et assuto glaucum mare findere lembo.

These boats were probably covered with either horse or bull hides. When used in England they were known as coracles; in Ireland they were styled curachs. Pliny tells us that Cæsar moved his army in Britain over lakes and rivers in such boats. Even the Greeks used them, terming them karabia, and the Russian word of korabl', or "ship," is derived from it. King Alfred, in 870–872, tells us that the Finns made sad havoc among the Swedish settlements on the numerous "meres" (lakes) in the moors of their country by "carrying their ships (baidars) overland in the meres whence they make depredations on the Northmen. Their ships are small and very light."

All air-dried seal pelts, no matter whether hair or fur seal, sea lion or walrus hides, are called by the Aleutians, and also by the Kamtchadales, "loughtak" or "lofftak." When the natives of Kamchatka told Steller in 1740–42 that the large hair seal, *Phoca barbata*, was known to them as "loughtak" they evidently did not give him their specific name for the seal, but rather expressed their sense of its large skin, which was so highly prized by them as to be "the loughtak" of all other loughtak in those waters of their country. *Erignathus barbatus* has never been seen around or on these islands of the Pribilof group, but every air-dried fur-seal or sea-lion skin there is called "loughtak" by the people.

GASTRONOMIC QUALITIES OF WALRUS MEAT.—The flavor of the raw, rank mollusca, upon which it feeds, seems to permeate the fiber of the flesh, making it very offensive to the civilized palate; but the Eskimos, who do not have the luxurious spread of sea-lion steak and fur-seal hams, regard it as highly and feed upon it as steadily as we do our own best corn-fed beef. Indeed, the walrus to the Eskimo answers just as the cocoa palm does to the South Sea islander; it feeds him, it clothes him, it heats and illuminates his "igloo," and it arms him for the chase, while he builds his summer shelter and rides upon the sea by virtue of its hide. Naturally, however, it is not much account to the seal hunters on the Pribilof Islands. They still find, by stirring up the sand dunes and digging about them at Northeast Point, all the ivory that they require for their domestic use on the islands, nothing else about the walrus being of the slightest economic value to them. Some authorities have spoken well of walrus meat as an article of diet. Either they had that sauce for it born of inordinate hunger, or else the cooks deceived them. Starving explorers in the Arctic regions could relish it—they would thankfully and gladly eat anything that was juicy and sustained life with zest and gastronomic fervor. The Eskimos naturally like it. It is a necessity to their existence, and thus a relish for it is acquired. I can readily understand, by personal experience, how a great many, perhaps a majority, of our own people could speak well, were they north, of seal meat, of whale "rind," and of polar-bear steaks, but I know that a mouthful of fresh or "cured" walrus flesh would make their "gorges rise." The St. Paul natives refuse to touch it as an article of diet in any shape or manner. I saw them removing the enormous testicles of one of the old bull walruses which was shot, for my purposes, on Walrus Island. They told me that they did so in obedience to the wish of the widow doctress of the village, Maria Seedova, who desired a pair for her incantations.

Curiosity, mingled with a desire to really understand, alone tempted me to taste the walrus meat which was placed before me at Poonook, on St. Lawrence Island, and candor compels me to say that it was worse than the old beaver's tail which I had been victimized with in British Columbia; worse than the tough brown bear steak of Bristol Bay—in fact, it is the worst of all fresh flesh of which I know. It has a strong flavor of an indefinite acrid nature, which turned my palate and my stomach instantaneously and simultaneously, while the surprised natives stared in bewildered silence at their astonished and disgusted guest. They, however, greedily put chunks 2 inches square, and even larger, of this flesh and blubber into their mouths as rapidly as the storage room there would permit—and with what grimy gusto—the corners of their large lips dripping with the fatness of their feeding. How little they thought then that in a few short seasons they would die of starvation sitting in these same "igloos"—their caches empty and nothing but endless fields of barren ice where the lifegiving sea should be. The winter of 1879–80 was one of exceptional rigor in the Arctic, although in the United States it was unusually mild and open. The ice closed in solid around St. Lawrence Island—so firm and unshaken by the giant leverage of wind and tide that the walruses were driven far to the southward and eastward beyond the reach of the unhappy inhabitants of that island, who, thus unexpectedly deprived of their mainstay and support, seem to have miserably starved to death, with the exception of one small village on the north shore. The residents of the Poonook, Poogovellyak, and Kagallegak settlements perished, to a soul, from hunger—nearly 300 men, women, and

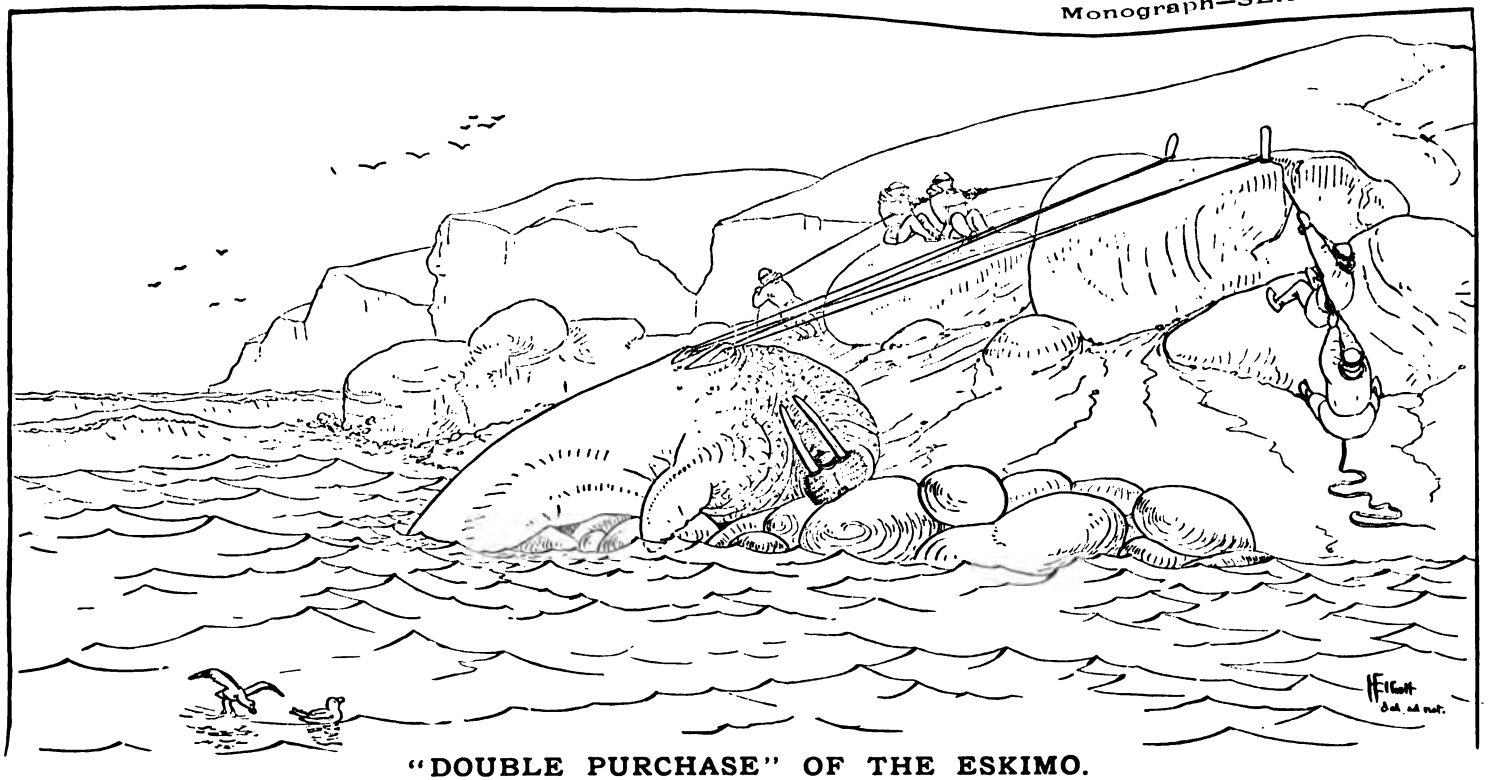
children. I recall the visit which I made to these settlements in August, 1874, with sadness, in this unfortunate connection, because they impressed me with their manifest superiority over the savages of the northwest coast. They seemed then to be living during nine months of the year almost wholly upon the flesh and oil of the walrus. Clean limbed, bright eyed, and jovial, they profoundly impressed me with their happy reliance and subsistence upon the walrus herds of Bering Sea. I could not help remarking then that these people had never been subjected to the temptations and subsequent sorrow of putting their trust in princes, hence their independence and good heart. But now it appears that it will not do to put your trust in walruses, either.

I know that it is said by Parry, by Hall, and lately by others, that the flesh of the Atlantic walrus is palatable. Perhaps the nature of food supply is the cause. We all recognize the wide difference in pork from hogs fed on corn and those fed on beech mast and oak acorns, and those which have lived upon the offal of the slaughtering houses or have gathered the decayed castings of the seashore. The walrus of Bering Sea lives upon that which does not give pleasant flavor to its flesh.

IMPERFECTION OF WALRUS IVORY.—Touching the ivory, I was struck, in looking over the tusks as they protruded from the live animals' mouths, by the fact that only rare examples of perfect teeth could be found; they were broken off irregularly, some quite close to the socket, hardly a single animal having a sound and uniform pair of tusks. Most of the walrus ivory taken is of very poor quality; it has a deep core, or yellow, suspended pith, and is frequently so cracked where the ivory is the whitest and the firmest as to be of mere nominal value. But exceptional teeth now and then occur of prodigious size and superior texture; these are carefully treasured and sold to great advantage.

THE ANTIQUITY OF WALRUS HUNTING.—Generally, when we look for the earliest records of this or that action or occupation, we are treated to a vast store of indeterminate material, upon which any theory or conjecture may be raised. But touching the case of the hunting of the fur seal and the walrus, in northern waters, we have exact data as to records of the earliest chase and capture of these animals by our own people. The history of walrus hunting comes down to us from rare old antiquity in this way: Shortly after 868 A. D., King Alfred of England gave a translation of the Spanish Ormestra, or "Di miserere mundi," of Paul Orosius in his mother tongue, the Anglo-Saxon. Into this complete and only geographical review of the earth's form, as known at that time, he interwove the relations of Othere and the Dane Wulfstan. The former was a great man from Norway; he undertook a voyage of discovery beyond the north cape of his native land, and to the then unknown eastward as far as our modern Finland, which he indicated as the "country of the Beormas." He shaped his course to this region "on account of the horse whales, inasmuch as they have very good bone in their teeth;" also, "this sort of whale is much less than the other kind, it being not larger commonly than seven ells;" and states further on that he, Othere, "had killed fifty-six in two days."

DESCHNEV THE FIRST TO SEE THE WALRUS OF BERING SEA.—The earliest personal record made of the walrus of Bering Sea was the discovery of these animals by Simeon Deschnev, that Cossack who, first of all civilized men, sailed through Bering Straits, October, 1648,



"DOUBLE PURCHASE" OF THE ESKIMO.

Innuits of St. Lawrence Island, Alaska, hoisting a Walrus carcass.

and who made use of their ivory, en voyage, in repairing his rude shallop. He also, in 1651, discovered extensive sand shoals north of the Anadyr mouth, upon which large herds of walrus were resting. But in this connection it is proper to say that the walrus of Bering Sea is the same animal of which Isaiah Ignatiev learned in 1646, when he led a party of Russian fur hunters east of the mouth of the Kolyma as far as Tchaun Bay. He did not see it, however, and traded with the Tschukchies for the teeth in question. His report of a nation rich in walrus ivory far to the eastward along the shores of the Polar Ocean is what stimulated the remarkable voyage of Deschnev above referred to, as well as many others who were not so successful,[1] viz: Staduchin, Alexiev, Ankudinov, Buldakov, all in 1647–1649.

BOREAL RANGE OF THE WALRUS OF BERING SEA.—The range of the Bering Sea walrus now appears to be restricted in the Arctic Ocean to an extreme westward at Cape Chelagskoi, on the Siberian Coast, and an extreme eastward between Point Barrow and the region of Point Beechey, on the Alaskan shore. It is, however, substantially confined between Koliutchin Bay, Siberia, and Point Barrow, Alaska. As far as its distribution in polar waters is concerned and how far to the north it travels from these coasts of the two continents, I am unable to present any well-authenticated data illustrative of the subject. The shores of Wrangell Land were found this year (1881) in possession of walrus herds.

The Japanese seem to have known of the walrus of Bering Sea, but evidently have not observed it—at least, I think so from the testimony of their spirited drawings of this animal. They represent it with the body, the neck, and the limbs of a horse, running on camel-like feet, with an equine head, from the upper jaw of which two enormous tusks depend. It is made to gallop rather as a land than a sea horse. The hair seals are very much better delineated by both Chinese and Japanese artists, and, further, no suggestion by such means has been made of the fur seal by them.

The chief demand for walrus ivory first came, and still comes, from those patient, skillful Mongolian hand carvers, who work the teeth up into a variety of exceedingly attractive articles, both useful and fanciful. Wrangell says that the Tschukchies "make long, narrow drinking vessels from the teeth," which require much time to hollow out. They are frequently sold to the Reindeer Tschukchies, who convey them to the Russians.

The walrus-ivory carving of the Alaskan Mahlemoots, at Oogashik and Nushagak, in particular is remarkably well executed. Clever and even beautiful imitations of our watch chains, guards, table and pocket cutlery, rings, bracelets, and necklace jewelry are made by them. They have earned the just reputation of being "the sculptors of the north."

PARRY'S HISTORY OF THE ATLANTIC WALRUS.—In closing here this

[1] Allen erroneously gives the credit (on p. 172, Hist. of N. A. Pinnipeds) of first discovery and report of the walrus ivory of Bering Sea to "the Cossack adventurer Staduchin, who found (about 1645 to 1648) its tusks on the Tschukchie Coast near the mouth of the Kolyma River. A century later Deschnev also found large quantities of walrus teeth on the sand bars at the mouth of the Anadyr." Michael Staduchin did not sail from the Kolyma mouth until 1649. He ventured at that time as far east, probably, as Cape Chelagskoi. He was obliged to return then, after getting a load of walrus teeth from the Tschukchies, but from whom he could get no meat or provision of any kind. He saw no more than his predecessor, Ignatiev, did three years prior. In other words, he did not then see the walrus itself.

brief biography of the walrus of Bering Sea, I desire to say that the graphic and detailed account given by Sir Edward Parry, in the narrative of his third voyage to the North Pole, of the manner in which the Eskimos hunt and use the walrus of Prince Regent Inlet (*Odobænus rosmarus*) fitly expresses my own observations made at St. Lawrence Island among the Tschukchie Eskimos there. Hence I shall not embody them in type. My illustrations will supply the vacancy which his accurate and lengthy description alone allows.[1] I call attention to this economic history of the Atlantic walrus by Parry, for in my opinion, it is written with great fidelity.

SPECIAL INVESTIGATIONS OF LIEUT. WASHBURN MAYNARD, U. S. N.

A SYNOPSIS OF LIEUTENANT MAYNARD'S REPORT.—In closing this biology of the seal life on the Pribilof Islands, it is not superfluous on my part to present to the reader a brief review of the writings which have been ordered by the Government upon the condition of the subject at the islands. I have previously called attention to the fact that prior to my work in 1872 and 1874, inclusive, a singular absence of a business-like and succinct method of comprehensive information existed in the archives of the Treasury Department, which is charged by law with the absolute control of these interests, and is responsible to Congress for the same. In order, therefore, that this statement of mine shall not pass as a mere assertion on my part, I deem it due to the history of the subject of this memoir, at the present writing, to give a brief abstract of the labors of those officials of the Government who have made the fur seals of Alaska the thesis of their publications and correspondence. These papers are so scattered that a combination here of their substance may not be uninteresting. I shall comment only upon those documents which have a direct reference to the Pribilof Islands.

SPECIAL REPORT OF LIEUT. WASHBURN MAYNARD, U. S. N.—Before touching upon the special labors of the Treasury officials, I wish to direct the attention of the reader to the following synopsis of an exceedingly concise and interesting contribution to the subject of the business on the seal islands. It is from the pen of Lieut. Washburn Maynard, U. S. N., and was submitted by him to the Secretary of the Navy on the 30th of November, 1874. His work of investigation was in obedience to the order of Congress expressed in an act approved April 22, 1874. The occasion of this gentleman's labor arose directly from the constant and reiterated charges, made more by insinuation than by specific writing, against the correctness of my published position in regard to the conduct of the business on the seal islands, and he proceeded to that field of duty conscious of the fact, and determined to settle it as far as he was able to by a thorough and personal scrutiny of the whole subject. He did so; and I now desire to embody the substance of his communication above referred to.

The only fault which can be found with Lieutenant Maynard's report is that it is exceedingly brief, though explicit. I should say here that

[1] As the natives of the Pribilof Islands do not hunt the walrus, I have in my studies of this animal introduced the figures, method, and costumes of the St. Lawrence Eskimos, which faithfully typify the entire Alaskan people, who live largely upon the flesh of this animal. I do so not only on account of its being wholly germane to the subject of my discussion in this monograph, but more so as it is the first pictorial presentation of the ideas involved ever given.

he evidently did not consider this writing, from which I shall quote, more than a simple statement of fact, and made it in the nature of an answer to the order of a superior officer.

SYNOPSIS OF LIEUTENANT MAYNARD'S INVESTIGATIONS.

THE SUBSTANCE OF LIEUTENANT MAYNARD'S REPORT.—The islands of St. Paul and St. George, or the seal islands, as they are more commonly called, are the principal ones of the Pribilof group; the other two, known as Otter and Walrus, are merely outlying islets. They are situated in Bering Sea, between the parallels of 56° to 58° of north latitude and 169° to 171° of west longitude. St. Paul has an area of 33 square miles, while St. George claims but 29, with, respectively, 42 and 29 miles of shore line each.

CLIMATE.—They are enveloped in summer by dense fogs, through which the sun rarely makes its way, and are surrounded in severe winters by fields of ice driven down by the arctic winds. They have no sheltered harbors beyond slight indentations in the shore line that afford a lee for vessels and tolerable landing places for boats when certain winds are blowing.

SHORES AND VEGETATION.—The shores are bold and rocky, with strips of sand beach, and are covered by broken rocks at intervals between them. The interior of both islands is broken and hilly; neither tree nor shrub grows upon them, but they are clothed with grass, moss, and wild flowers. For nearly one hundred years fur seals have been known to visit them annually in great numbers for the purpose of bringing forth and raising their young, which circumstance gives those islands their great commercial importance.

HABITS OF THE SEAL.—These seals occupy the islands from the breaking away of the ice in the spring until it surrounds their coasts again in early winter—that is, from the middle of May until December. In milder hyemal seasons, when there is little or no ice about the islands, a few seals have been seen swimming around in the water throughout the entire year, but these exhibitions rarely occur. The fur seals are not known to haul up on land elsewhere within the limits of the North Pacific Ocean, except at Bering and Copper islands, lying in Bering Sea near the Asiatic coast, and Robbins Reef, a small rock on the coast. They certainly go from those landing places to the southward in the fall, for they are frequently seen in the sea, either solitary or in shoals of thousands, and are killed in the water all the way from Sitka to the Straits of Fuca. In 1833, 54 were taken by the Russians on the Farralone Islands, off seaward from the entrance to the Bay of San Francisco. There seems to be no reason why they can not remain in the water during the entire time they are absent from the island, for they eat their food there at all times, and are able to sleep upon its surface.

CLASSIFICATION OF THE SEALS.—They may be divided into two classes—the breeding and the nonbreeding seals. The former comprise the full-grown males or bulls, the adult females or cows, and their young or pups. The latter embrace the young or bachelor males and the yearlings of both classes. Each of these classes leave the water and haul up along the shores of the islands nearly in juxtaposition to each other as they are massed on the land, but they are entirely separate. They choose certain portions of the shore to the exclusion of the rest, not all of any one class being together, but spreading into many communities, which are often several miles apart.

POSITION OF THE BREEDING ROOKERIES.—The breeding seals occupy a slip of ground between the cliffs, which is covered with bowlders and broken rocks, beginning a few feet above high-water mark and extending back over a depth of from 50 to 200 feet in a compact and uniform mass. Such places are called breeding rookeries.

POSITION OF THE HAULING GROUNDS.—The nonbreeding seals, on the contrary, are scattered over the sand beaches and the higher ground in the rear without any regular order of distribution. When these hauling grounds lie to the rear of the breeding grounds, as they sometimes do, pathways are left open in the rookeries at convenient points to allow a passage up from the sea and back thereto for the nonbreeding seals.

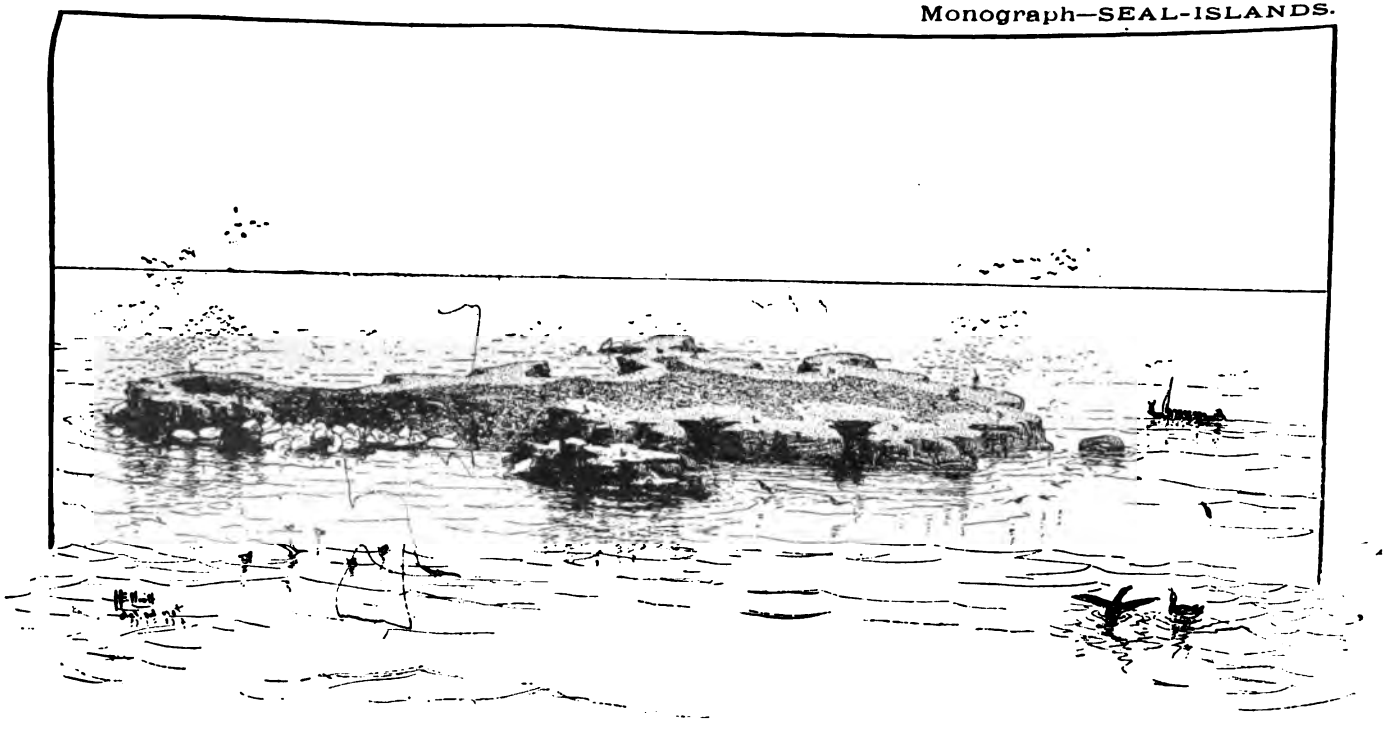
NUMBER OF ROOKERIES.—There are seven rookeries on St. Paul Island, extending, with the adjacent hauling grounds, over one-third of its shore line, and on St. George Island there are five breeding places and hauling reaches, which, however, take up less than one-tenth of its coast. These breeding grounds are reoccupied each year with but little change.

DESCRIPTION OF THE LANDING OF THE SEAL.—About the middle of May, usually, the bulls, which are the first of the breeding seals to arrive, crawl from the water and establish the rookeries in readiness for the cows that begin to come somewhat later. It seems probable that the rookeries are occupied by the same bulls and cows from year to year, as they (the rookery grounds) change but little, either in size or form; but it has been proven that the bachelors do not return to the same hauling grounds, or even to the same island, with regularity from year to year. The time of arrival of cows is governed by their period of gestation, as they do not appear on the rookeries until within a short time of giving birth to their pups. Hence all do not come at the same period, but arrive continuously from the last days of May until the middle of July.

POLYGAMOUS AND ANGRY NATURE OF THE MALES.—The bulls are polygamous, having from twenty to fifty cows each, so the number of them upon the rookeries is not more than one-tenth of that of the cows. They have frequent and bloody fights for the possession and retention of their places upon the breeding grounds, and for control of the cows, in which they are often killed or are driven from the rookeries, and are more or less badly bitten by the sharp teeth of their opponents. The females do not even always escape unhurt, as two males seize one and literally tear her in two by their struggle for her possession.

ARRIVAL OF THE FEMALES AND BIRTH OF THEIR YOUNG.—The cows are continuously arriving upon the rookeries and giving birth to their pups from the last of May until the middle of July. Usually each female bears a single pup, though I have been told by persons whose statement I have no reason to doubt that they have witnessed one or two instances of twins. From the 20th to the 25th of July the rookeries are fuller than at any other time during the season, as the pups have all been born, and all the bulls, cows, and pups remain within these limits.

PROTRACTED FASTING OF THE MALES.—During the breeding season, which lasts three consecutive months, or nearly so, the bulls remain upon the rookeries, never leaving them for an instant even to procure food. This fast and the constant watchfulness necessary to keep their harems together, and to prevent the encroachments of other bulls and the service of the cows renders their position no sinecure.



WALRUS ISLET.

Showing the Walrus as it herds, and the peculiar zones of breeding-birds.

A. Cliff fronts occupied by the Rissa and Kittiwake gulls, and the cormorant (*Rissa brevirostris*, *Larus tridactylus*, and *Gra. ulus bicristatus*). b b b. Plateau belt covered by the Arries (*Lomvia arra*) to the exclusion of all other water-fowl. It is white with the droppings of these birds. c c c. The grassy interior, occupied chiefly by the Burgomaster gull (*Larus glaucus*), and a few *Rissa* and *L. tridactylus*. d. Rocky shingle and loose surf-thrown bowlders, between and in the chinks of which the Auks and Puffins nest. e. Walrus herds on the "Echouries."

Their emaciated bodies and loose and wrinkled skins at the close of the season are in marked contrast to the fat, sleek-looking cows, for the latter have been constantly going and coming between the rookeries and the water, so that at any one time there are seldom more than one-half of the females on land.

CHANGES AT THE CLOSE OF THE SEASON.—About the 1st of August the breeding season ends, and the pups, which grow rapidly, now are large and strong enough to move about, so that the rookeries begin to lose their compact form and rigid exclusiveness. The bulls begin to go into the water, their places being filled by the younger males, which up to this time have not been allowed by the older males to go upon the rookeries, while the cows and pups spread back over the haulings in scattered groups and occupy more than twice the space that had previously held them.

ARRIVAL AND LANDING OF THE BACHELOR SEALS.—Meanwhile the young males or bachelor seals have been coming to the hauling grounds, which are covered more or less thickly by them all summer. They do not remain on shore long at any one time, but haul up to sleep and play for awhile, and then return to the water for food. They are so numerous, however, that thousands can always be seen upon the hauling grounds, because all of them are never either on shore or in the water at the same time. The yearling seals, distinguished by their size and the silvery color of their sides and abdomens, do not make their appearance until the latter part of July; then they arrive together in a great body, males and females, and go out upon the hauling grounds in large numbers and play one with the other for hours at a time. The bachelors join them in the sport, and singling out the baby cows form mimic rookeries and imitate the roaring, fighting, and caressing of the bulls in a ludicrous manner.

SHEDDING OF THE PUPS AND THEIR LEARNING TO SWIM.—In September and October the pups exchange their coat of black hair, which has been their only covering from their birth, for one of fur and hair combined, similar in appearance to that of the yearling, and then begin to learn to swim, so as to be ready for their departure from the islands in November and December. Prior to this period many of them are killed by the surf, especially if the season be a stormy one, since they are not strong enough swimmers or expert enough to save themselves from being dashed against the rocks by the heavy rollers. The cows remain with their pups and suckle them until all classes have left the islands, usually by the 1st or 10th of December. It is probable that of all the seals born each year an aggregate of about one-half are males. The experiment was tried of examining 100 pups, taken at random from the rookeries, and in that number the sexes were about equally divided. The number of bachelor seals in proportion to the cows would also seem to confirm the supposition.

CHARACTERISTIC CHANGES OF THE PELAGE.—There is not the slightest perceptible difference in appearance between the seals of the two classes, either in the first or in the second year after their birth, but as they grow older they vary and diverge in the tinting of their coats, so as to be readily determined each from the other. The pups, when born, have only short black hair, no fur. This coat is gradually replaced in their first year by a dress of fine elastic fur, of a light-buff color, and of hair longer than the fur, so as to cover it completely and give that silvery gray to their sides and bellies and that dark gray characteristic of their necks and heads. The color of their hair changes in their second year to a uniform dark gray. In their fifth

year the hair upon the neck and shoulders of the males begins to grow coarser and longer, forming a sort of mane, which increases in length and stiffness until the animal attains its full growth, during the lapse of its eighth or ninth year of life. The females are not found upon the hauling grounds with the males after they are 2 years old, hence it seems probable that they go from the rookery in their third and bear a pup in their fourth year. When both are full grown the sexes differ most widely in appearance. The male, weighing from four to five hundred pounds, is about three times as large as the female, has a mane, and is either black or dark brown in color. The tinting of the female is a soft, rich brown on the back and sides, changing almost to orange upon the belly, and there is no mane. The fur of the cows is rather thicker and finer than that of the yearling seals, though the skins of young males from 3 to 6 years old are not very much inferior.

IMPORTANCE OF KNOWING THE NUMBER OF SEALS.—It is of very great significance in this connection to know how many seals come annually to the islands, or rather to understand how many may be killed for their skins annually, without causing less to come hereafter than do at the present time. To determine how many there are with accuracy is a task almost on a par with that of numbering the stars. The singular motion of the animals when on shore, the great variety in size, color, and position, the extent of surface over which they are spread, and the fact that it can not be determined exactly what proportion of them, of their several classes, are on shore at any given time—all these desiderata for comprehension make it simply impossible to get more than an approximation of their numbers. They have been variously estimated at from one to fifteen millions.

METHODS OF ENUMERATION OF THE FUR SEAL.—I think the most accurate enumeration yet made is that by Mr. H. W. Elliott, special agent of the Treasury Department, in 1872. This calculation is based upon the hypothesis that the breeding seals are governed in hauling by a common and invariable law of distribution, which is that the area of the rookery ground is directly proportional to the number of seals occupying it. He estimates that there is one seal to every 2 square feet of rookery surface. Hence the problem is reduced to the simple operation of obtaining half the sum of the superficial area of all the rookeries in square feet. He surveyed these breeding grounds of both islands in 1872 and 1873, when at their greatest limit of expansion, and obtained the following results: Upon St. Paul Island there were 6,060,000 feet of ground occupied by 3,030,000 breeding seals and their young. On St. George Island he announced 326,840 square feet of superficial rookery area occupied by 163,420 breeding seals and their young; a total for both islands of 3,193,420 breeding seals and their young. The number of nonbreeding seals can not be determined in the foregoing manner, as they haul most irregularly, but it seems to me probable that they are nearly as numerous as the other class is. If so, it would give not far from 6,000,000 as the stated number of seals of all kinds which visited the Pribilof Islands during the season of 1872.

GENERAL ACCURACY OF THESE RESULTS.—It is likely that these figures are not far from the truth, but I do not think it necessary myself to take into consideration the actual number of seals in order to decide the question of how many can be taken each year without injury to the fishery. The law that the size of the rookeries varies directly as the number of seals increases or diminishes seems to me, after close and repeated observation, to be correct. All the rookeries, whether large or small, are uniform in appearance, alike com-

rookery be made every year, showing accurately its size and when at its greatest expansion, which is between the 10th and of July annually, a comparison of this map will give the relative er of the breeding seals as they increase or diminish from year ar. I submit with this report maps of St. Paul and St. George ls, showing the extended location of breeding rookeries and ng grounds upon them. These maps are from surveys made in 1874, by Mr. Elliott and myself, and a map of each rookery on islands, drawn from careful surveys made by Mr. Elliott in 1872, s them now as they were in the season of 1874 as compared with of 1872. I respectfully recommend that enlarged copies of these maps be furnished to the Government agents in charge of the ls, and that they be required to compare them each year with espective rookeries and note what change in size and form, if exists upon them. This, if carefully done, will afford data after e by which the seal fisheries can be regulated with comparative inty so as to produce the greatest revenue to the Government out injury to this valuable interest.

MBER OF SEALS KILLED.—Since 1870 there have been killed on islands 112,000 young male seals each year. Whether this hter has prevented the seals from increasing in numbers or not, f so, to what extent, can only be deduced from their past history, unfortunately is very imperfectly given. In 1836 to 1839 there fewer seals upon the islands than had ever been seen before since first discovery in 1786. On St. Paul Island then there were not than 12,000 or 15,000 of all kinds. The killing of them was then ed, and not resumed until 1845, when it was done gradually, and, d never been the case before, only the young males were killed. rookeries continued to increase in size until 1857, since which they have remained in about the same aggregate, although a less er of bachelor seals were killed yearly between 1857 and 1868 have been slaughtered since.

OUGHTS ON THEIR INCREASE AND DIMINUTION FOR THE FUTURE.—would seem to show that there is a limit beyond which they will ncrease, and that this limit, a natural one, has been reached. If

only be partial; that is to say, we can limit the number to be killed when they are within our reach, and prevent their being dispersed on the breeding rookeries, or driven from the islands. On the other hand, the question raised is, whether the killing of the number above mentioned has had, or has not had, the effect of decreasing the aggregate number of seals. Judging from the comparison between the maps of the rookeries as they were in 1872 and the condition of the rookeries themselves as surveyed, and from the testimony of the best informed men on the island, both whites and natives, I think it has not as yet. Since the young males alone are killed, injury would be effected through this action if it did not allow a sufficient number to reach that maturity necessary for the satisfaction of all demands of the breeding females on the rookeries. The young males do not grow strong enough to reach the rookeries until they are at least 6 years old; hence the effect of the first year's killing can not be seen in that connection until the pups have attained this age. For that reason it seems to me that it is now a little too soon to decide whether we are killing too many or not, since the present conduct of affairs has now been only four years in operation. It is possible, however, that more, even twice as many as are now killed annually, might be taken every year without injury, but it would be making a severe and most hazardous experiment before any definite result has been obtained from the first, which is now in operation. The number now killed annually is entirely experimental, because we have nothing to start from in the past as a basis of estimation for the future until the effect produced is satisfactorily shown. I would, therefore, not recommend an extension of the contract as to the number of seals to be killed until within seven or eight years from the date of the one now existing went into effect, when, if the rookeries have not decreased in size, it can then safely be done.

THE LEASE OF THE ISLANDS.—In June, 1870, Congress passed an act entitled "An act to prevent the extermination of the fur-bearing animals in Alaska," which authorized the Secretary of the Treasury to lease to private parties for a term of years the right to engage in the business of taking fur seals on the islands of St. Paul and St. George, under certain specified conditions and restrictions. Therefore, the subject was publicly advertised, and bids solicited, the privilege to be awarded to the highest responsible bidder. A number of individuals doing business in San Francisco under the firm name of the "Alaska Commercial Company" were the successful bidders, and the right was granted to them under the terms of the lease now in force (a copy of which is here annexed) for a period of twenty years, from the 1st day of May, 1870. The terms were not arranged and the lease delivered until the 31st day of August, 1870, and the vessels and agents of the company did not reach the islands until the 1st of October. The season allowed by law for killing seals being nearly over, but few skins, consequently, were taken by the company that year (3,448 on St. Paul, and 5,789 on St. George Island). But the following and each succeeding year they have taken nearly the full number.

When the lease was made it was erroneously supposed that there were about one-third as many seals on St. George Island as there were on St. Paul, and, in consequence of this understanding, the number to be taken from each island was fixed at 25,000 and 75,000 respectively. In reality there are only about one-eighteenth as many on the former as on the latter, which fact having been clearly shown by Mr. Elliott, the power was given to the Secretary of the Treasury by Con-

gress to change the ratio on each island to a correct basis. In consideration of being the only company allowed to take fur seals on the islands, it has agreed to pay a yearly rental for the use of them, and a tax or duty upon each skin taken and shipped from them; not to kill more than the stipulated number of seals, and seals of a particular kind; not to molest them on the rookeries or in the water, and to do nothing which would tend to frighten them from the islands, to provide for the comfort, maintenance, education, and protection of the native inhabitants, and neither to furnish nor allow any of its agents to use distilled spirits or spirituous liquors, or to supply them to any of the natives.

EMPLOYEES OF THE ALASKA COMMERCIAL COMPANY.—The company employs on St. Paul an agent who has general charge of the business on both islands, three assistants, a physician, a school teacher, three carpenters, a cooper, a steward, and a cook; and on St. George, an agent, a physician, a school teacher, and a cook.

CONDUCT OF THE SEALING.—The great work of the season, the taking and curing of seal skins, begins the first week in June, and is pushed forward as rapidly as possible, as the skins are in the best condition early in the season. This year 90,000 skins were taken on St. Paul by 84 men in 39 days. The natives do all the work of driving, killing, and skinning the seals and of curing and bundling the skins, under the direction of the company's agents and of their own chiefs. The first operation is that of driving the seals from the hauling to the killing grounds. The latter are near the salt houses, which are built at points most convenient for shipping the skins, and all the killing is done upon them in order not to disturb the other seals and to save the labor of carrying the skins. The seals suitable for killing (which are the young males from 2 to 6 years old) are readily collected into droves upon the hunting grounds by getting between them and the water, and are driven as easily as a flock of sheep. They move in a clumsy gallop, their bellies being raised entirely from the ground, upon their flippers, which gives them when in motion the appearance of bears. They are sometimes called "sea bears" on account of this resemblance. In driving them care is taken not to hurry them, for if driven too fast they crowd together and injure the skins by biting each other and also become overheated and exhausted. They are driven from one-half mile to 5 miles in from three to thirty-six hours, according to the location of the hauling grounds. After reaching the killing grounds they are allowed to rest and cool for several hours, particularly if the drive has been a long one. The drives vary in number from five hundred to as many thousand, as there happen to be few or many seals upon the hauling ground where the drive is made. In each drive there are some seals that are either so large or so small that their skins are not desirable, and sometimes a few females are driven up—not often, however, as they seldom stray from the rookeries. All such are singled out and permitted to escape to the water. The killing is done with a blow on the head by a stout club, which crushes the skull, after which the skins are taken off and carried into the salt houses. During the first half of the month of June from 5 to 8 per cent of the seals in the drive are turned away, being either too small or too large, and from 10 to 12 per cent during the latter half. In July the percentage is still greater, being about 40 per cent for the first and from 60 to 75 per cent for the latter half. About one-half the seals killed are about 3 years old, one-fourth 4, and the remainder 2, 5, and 6. No yearlings have been killed up to the

present time, though allowed by the lease, as their skins are too small to be salable in the present state of the trade, but by some change in it they may become desirable in the future, and would then be taken. This would, however, injure the fisheries, because the yearlings of both sexes haul together, and it would be almost impossible to separate them so as to kill only the males. There has been a waste in taking the skins, due partly to the inexperience of the company's agent and partly to accident and the carelessness of the natives. In making the drives, particularly if they are long and the sun happens to pierce through the fog, some of the seals become exhausted and die at such a distance from the salt houses that their skins can not well be carried to them by hand, and are therefore left upon the bodies. This was remedied during the last killing season by having a horse and cart to follow the drive and to collect such skins. Some skins have also been lost by killing more seals at a time than the force of men employed could take care of properly. Good judgment and constant care are required in taking the skins, as fifteen minutes' exposure to the sun will spoil them by loosening the fur. Another source of waste is by cutting the skins in taking them off in such a manner as to ruin them. It was very difficult at first to induce the natives to use their knives carefully, and several hundred skins were lost in a season by careless skinning, but by refusing to accept and pay for badly-cut skins the number has been greatly reduced, so that the loss this year on St. Paul was but 130 from all causes. The salt houses are arranged with large bins, called kenches, made of thick planks, into which the skins are put, fur-side down, with a layer of salt between each two layers of skins. They become sufficiently cured in from five to seven days, and are then taken from the kenches and piled up in "books," with a little fresh salt. Finally they are prepared for shipment by rolling them into compact bundles, two skins in each, which are secured with stout lashings. The largest of these bundles weigh 64 pounds, but their average weight is but 22. The smallest skins, those taken from seals 2 years old, weigh about 7 pounds each, and the largest, from seals 6 years old, about 30.

COUNTING THE SKINS.—The skins are counted four times at the island, as follows: By the company's agent and the native chiefs when they are put into the salt houses, the latter giving in their accounts after each day's killing to the Government agent; again when they are bundled by the natives who do the work, as each is paid for his labor by the bundle; by the Government agents when they are taken from the salt houses for shipment, and the fourth time by the first officer of the company's steamer as they are delivered on board. An official certificate of the number of skins shipped is made out and signed by the Government agents in triplicate, one copy being sent to the Treasury Department, one to the collector of San Francisco, the third given to the master of the vessel in which they are shipped. The amount of the tax or duty paid by the company to the Government is determined by the result of a final counting at the custom-house in San Francisco. The books of the company show that it has paid into the Treasury since the date of the lease (up to the present writing, November 30, 1874) $170,480.54 on account of the rental of the islands and $1,057,709.74 as tax on the seal skins taken. The latter sum is less by $16,458.63 than the tax that should have been paid had 100,000 skins been taken each year since 1870, or, in other words, 6,269 fewer skins have been shipped than the law permitted. The record kept at the islands by both the Government's and company's agents shows that in 1871 but 19,077 skins were taken from

St. George instead of 25,000, the legal number allowed, and that every year since the number shipped has fallen a little short of 100,000.

POLICY OF THE ALASKA COMMERCIAL COMPANY.—The company has wisely adopted a fair and liberal policy in its dealings with the natives, and is more than repaid for the expense incurred by the increased ease and rapidity with which they work while taking skins. I examined carefully the books and papers of the company, both at its office in San Francisco and upon the island; also the record kept by the Government agents, and talked privately with the most intelligent of the natives, but I was unable to discover by so doing that there has been any fraud practiced toward the Government or want of compliance with the terms of the lease. The natives keep a jealous watch upon the seals, being fully impressed with the fact that their welfare depends upon the safety of the fisheries, and they are also well informed in regard to all laws and contracts which have been made by the Government concerning them.

TREATMENT OF THE NATIVES BY THE COMPANY.—The lease requires that provision be made by the company for the comfort, maintenance, education, and protection of the native inhabitants of the islands.

The natives do all the work of taking and curing the seal skins, for which they are paid by the company 40 cents a skin. This produces each year a fund of $40,000, which is divided between the inhabitants of the two islands, according to the number of skins taken from each, which gives $30,000 to the people of St. Paul and $10;000 to those of St. George. In addition to this, they are paid 40 cents apiece for sea-lion skins, 10 cents for their throats, and $5 a barrel for their intestines. As this sum is earned by the joint labor of all the able-bodied men, it is considered a common fund, to be divided equitably among them. Payment is made for all other labor to each individual performing it at established rates. In dividing the sealing fund the ability of the sealers is considered and the division made accordingly. Thus the strongest and most skillful men, who work the entire season, receive a first-class share. Those who are less skillful, and the old men who are unable to do the harder part of the work, receive second and third shares, while the boys who take part in the sealing for the first time receive a fourth-class share. The assignment of shares is made by the chiefs and acquiesced in by the others. Each year, after all the skins have been taken, the chiefs furnish the company's agents with a list of the men who have been engaged in sealing during the season, and the share assigned to each. The second, third, and fourth class are, respectively, 90, 80, and 70 per cent of the first-class share. Two first-class shares are voluntarily given for the support of the church and one for that of the priest. The value of the shares varies a little from year to year, with the number of men engaged in sealing. This year (1874) it was for each, respectively, $429.53, $368.58, $343.62, and $300.63. The result of the division is formally made to the people by the company's agents, through the chiefs and in the presence of the Government's agents. These sums are not paid at the time to the natives, but are placed to their credit in the book of the company and in pass books which are furnished to each man. All other labor is paid for in coin when performed, at the rate of from 6 to 10 cents an hour, according to the nature of the work, except that of bundling skins, which is at the rate of 1 cent a bundle. The first chief is paid a monthly salary of $15, and each of the others, three in number, one of $10, in addition to their shares of the sealing fund. Other natives, men and women, employed throughout the year in other capacities, receive from $4 to $30 a month and board.

THE COMPANY'S STORE.—Clothing, provisions, and other articles are kept in the company's storehouses on the island, and are sold to the natives at prices not exceeding those for which the same could be bought at retail in San Francisco. I examined the goods and found them to be of good quality. The people have but little idea of economy, and would spend all their money in a short time for certain articles of which they are fond, hence it is necessary to limit their sale, such as butter, sugar, and perfumery. They are encouraged to save money by the company, which receives deposits from them, subject to the usual rules of "savings banks," and pays an interest of 9 per cent per annum. Deposits range from $100 to $1,100. The church has a deposit of $8,000. Some are in debt to the company, but become less so every year. Such as are without means of support, widows and orphan children, are supported by the company.

SANITARY ADVANCEMENT.—The natives live partly in "barrabaras," or earth houses, and partly in comfortable frame houses. Thirty of the latter have been built within the last two years by the company and given rent free. Others are being built as rapidly as possible, it being the intention of the company to give each family a house. The lease requires the annual delivery upon the island of 60 cords of firewood and 25,000 dried salmon, for the use of the natives; but, with the consent of the Secretary of the Treasury, coal, ton for cord, has been substituted for the former, and an equivalent quantity of salted salmon and codfish for the latter. Both have been regularly supplied, as shown by the receipts of the Government agent and the statements of the natives, together with as much salt and as many barrels as have been desired for curing and storing their seal meat.

Two physicians are in the employ of the company, one residing on each island, who are charged with the care of the sick, and have already, by their efforts, seconded by the example of the other white residents, induced greater cleanliness and a more healthful mode of living among the natives.

SCHOOL ATTENDANCE.—The education of the native children has not been neglected, though so far the attempt to teach them has not been as successful as could be desired. For each island a competent teacher, a convenient and well-warmed school room, and a supply of school books, etc., have been provided every year from the 1st of October until the 1st of June, but the difficulty has been to induce the parents to send their children, as they do not think them able to learn both English and Russian, and as the latter is the language of their church they consider it the most important. The average attendance at the school on St. George has been but 5 or 6, while there are from 30 to 40 children, and on St. Paul but 4 or 5, with from 40 to 50 children. Last year on the latter island there was a better attendance, and the children made considerable progress. The prejudice of the older people seems likely to wear away, as they learn a little English themselves from constantly hearing it, and will doubtless disappear after a time.

TERMS OF THE SEAL-ISLAND LEASE FROM THE GOVERNMENT.

This indenture in duplicate, made this 3d day of August, A. D. 1870, by and between William A. Richardson, Acting Secretary of the Treasury, in pursuance of an act of Congress approved July 1, 1870, entitled "An act to prevent the extermination of fur-bearing animals in Alaska," and the Alaska Commercial Company, a corporation duly established under the laws of the State of California, acting by John F. Miller, its president and agent, in accordance with a resolution at a meeting of its board of trustees, held January 31, 1870, witnesseth:

That said Secretary hereby leases to the said Alaska Commercial Company,

without power of transfer, for the term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur seals on the islands of St. George and St. Paul within the Territory of Alaska, and to send a vessel or vessels to said island for the skins of such seals.

And the said Alaska Commercial Company, in consideration of their right under this lease, hereby covenant and agree to pay, for each year during said term and in proportion during any part thereof, the sum of $55,000 into the Treasury of the United States in accordance with the regulations of the Secretary to be made for this purpose under said act, which payment shall be secured by deposit of United States bonds to that amount, and also covenant and agree to pay annually into the Treasury of the United States, under said rules and regulations, an internal-revenue tax or duty of $2 for each seal skin taken and shipped by them in accordance with the provisions of the act aforesaid, and also the sum of 60½ cents for each fur-seal skin taken and shipped, and 55 cents per gallon for each gallon of oil obtained from said seals, for sale in said islands or elsewhere, and sold by said company; and also covenant and agree, in accordance with said rules and regulations, to furnish, free of charge, the inhabitants of the islands of St. Paul and St. George annually during said term 25,000 dried salmon, 60 cords firewood, and a sufficient quantity of salt and a sufficient quantity of barrels for preserving the necessary supply of meat.

And the said lessees also hereby covenant and agree during the term aforesaid to maintain a school on each island, in accordance with said rules and regulations and suitable for the education of the natives of said islands, for a period of not less than eight months in each year.

And the said lessees further covenant and agree not to kill upon said island of St. Paul more than 75,000 fur seals, and upon the island of St. George not more than 25,000 fur seals per annum; not to kill any fur seals upon the islands aforesaid in any other month except the months of June, July, September, and October of each year; not to kill said seals at any time by the use of firearms or means tending to drive said seals from said islands; not to kill any female seals or seals under one year old; not to kill any seal in waters adjacent to said islands, or on the beach, cliffs, or rocks, where they haul up from the sea to remain.

And the said lessees further covenant and agree to abide by any restriction or limitation upon the right to kill seals under this lease that the act prescribes or that the Secretary of the Treasury shall judge necessary for the preservation of such seals.

And the said lessees hereby agree that they will not in any way sell, transfer, or assign this lease, and that any transfer, sale, or assignment of the same shall be void and of no effect.

And the said lessees further agree to furnish to the several masters of the vessels employed by them certified copies of this lease to be presented to the Government revenue officers for the time being in charge of said islands as the authority of said lessees for the landing and taking of said skins.

And the said lessees further covenant and agree that they or their agents shall not keep, sell, furnish, give, or dispose of any distilled spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine.

And the said lessees further covenant and agree that this lease is accepted subject to all needful rules and regulations which shall at any time or times hereafter be made by the Secretary of the Treasury for the collection and payment of the rental herein agreed to be paid by said lessees for the comfort, maintenance, education, and protection of the natives of said islands and for carrying into effect all the provisions of the act aforesaid, and will abide by and conform to said rules and regulations.

And the said lessees, accepting this lease with a full knowledge of the provisions of the aforesaid act of Congress, further covenant and agree that they will fulfill all the provisions, requirements, and limitations of said act, whether herein specifically set out or not.

In witness whereof the parties aforesaid have hereunto set their hands and seals the day and year above written.

[SEAL.] WILLIAM A. RICHARDSON,
Acting Secretary of the Treasury.

[SEAL.] ALASKA COMMERCIAL COMPANY,
By JOHN F. MILLER,
President.

Executed in presence of—
J. H. SAVILLE.

EPITOME OF SPECIAL REPORTS UPON THE SEAL ISLANDS IN THE ARCHIVES OF THE TREASURY DEPARTMENT.

THE OFFICIAL FILES OF THE TREASURY DEPARTMENT.—The first direct reports received by the Government from its agents were those of Charles Bryant and H. H. McIntyre, each dated November 30, 1869, and addressed to the Secretary of the Treasury. They were published by order of Congress, January 26, 1870. (See Ex. Doc. No. 32, Forty-first Congress, second session.) The references made to the seal life in these documents are very brief and general.

On the 30th December, 1870, the next communication from the seal islands touching the condition of the animals, etc., was received by the Treasury Department from its agent, Mr. S. N. Büynitsky. It is a very brief review of the whole state of affairs. (See Ex. Doc. No. 83, Forty-fourth Congress, first session, pp. 41 and 44, inclusive.) This is followed on November 10, 1871, by another report upon the same subject by Charles Bryant, still brief and general. (Ex. Doc. No. 83, Forty-fourth Congress, first session, pp. 59 and 66, inclusive.) It is a mere synopsis of the success of the sealing season, and is followed by another routine report by the same author, dated August 15, 1872, of the same vague and general tenor.

A series of brief annual reports of this character by the agents of the Treasury Department have been annually received by the Government from Messrs. Bryant, Morton, and Otis, respectively, up to date, being all restricted to short business recapitulations of the season's work in sealing, condition of the natives, etc. They are supplemented and illustrated by the reports made by the assistant special agents of the Treasury Department, who address their communications to the Treasury agent in charge, or chief special officer of the Government.

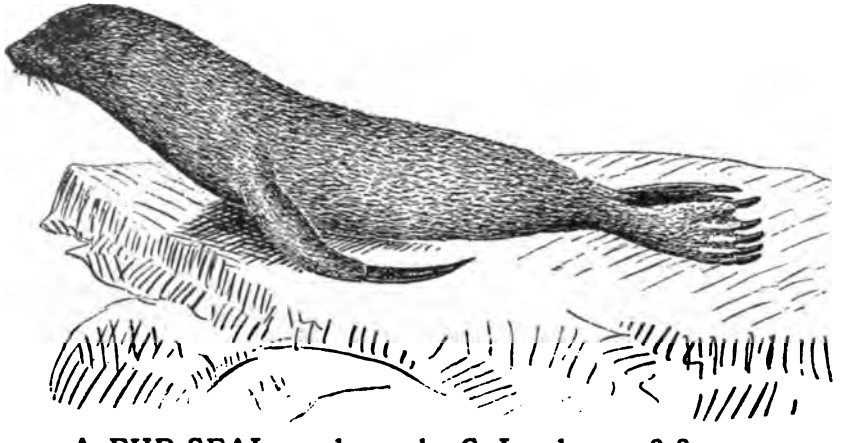
The last two annual reports of Colonel Otis, special agent Treasury Department, are elaborated in regard to the details of sealing labor and figures of the progress of the work itself. He gives no special attention to the life and habits of the fur seal in his communication to the Secretary.

THE RUSSIAN SEAL ISLANDS, BERING AND COPPER, OR THE COMMANDER GROUP.

[Extracted from Professor Nordenskiöld's report in reference to Bering Island; translated by Capt. G. Niebaum.]

ARRIVAL OF NORDENSKIÖLD: LOCATION OF BERING ISLAND.—The *Vega* anchored on the 14th August, 1879, in a rather poor, open harbor on the northwest coast of the island. Bering Island is the most westerly of the Aleutian Islands, and is situated nearest Kamchatka. It does not belong, nor does the neighboring Copper Island, to America, but to Asia, and is controlled by Russia; nevertheless, the American Alaska Company have obtained the hunting privilege and maintain here a not inconsiderable trading station, which consists of about 300 inhabitants, supplying them with provisions and manufactured goods, and from them in turn receiving their labor, principally rendered in taking skins of the eared seal or sea bear (*Otaria ursina*). Between 40,000 and 100,000[1] of these animals are killed yearly on this

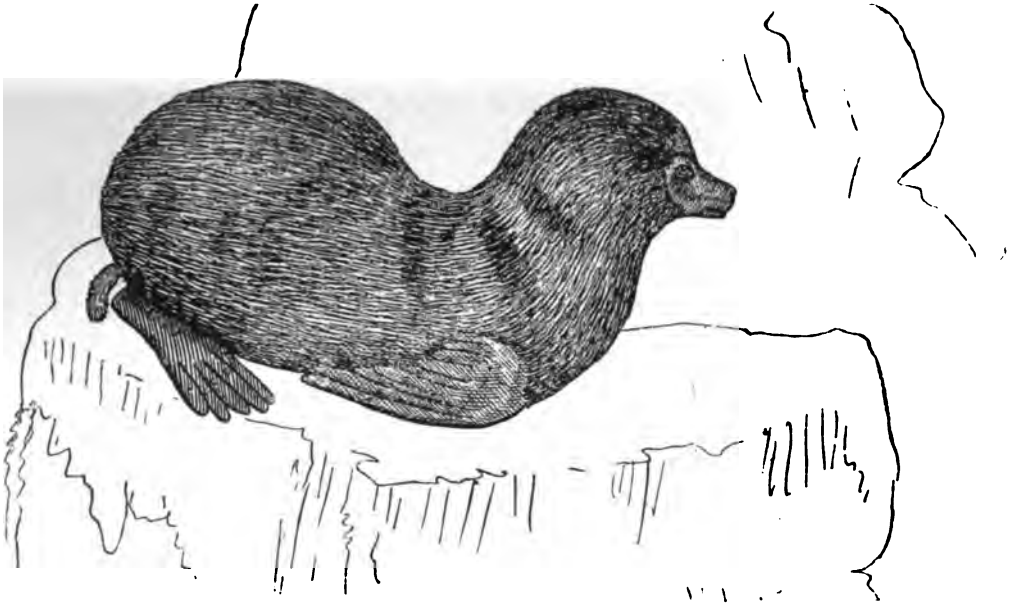
[1]These figures are in error; the table given at the close of this translation will show it. It is well known that the fur seal, as it bred, was first seen and described by Steller, who wrote his description on this island, when shipwrecked there with



A FUR-SEAL, as drawn by C. Landseer, 1848.

"O. nigra—Black Otary." [Encyclo. Metropolitana, London, 1848, Fig. 2, pl. ix, p. 109.]

[Evidently drawn from an alcoholic or air-dried specimen of an *Arctocephalus* pup, in its black natal coat.—H. W. E.]



THE FUR-SEAL.

(Callorhinus ursinus.)

[Fac-simile of a figure engraved on steel from a drawing by Sidney Edwards based upon Steller's description, published as "Phoca ursina" in the Book of Nature, vol. i, pl. 53, Phila., 1834. This is, in its aggregate, one of the best figures of the Fur-seal given to the world prior to my life-studies on the Pribylov Islands, 1872–'76, inclusive.—H. W. E.]

and the neighboring Copper Island; those are the animals from which is obtained the brown, silky, soft seal skin which of late has become so fashionable. In order to watch over the interest of the Russian Government and to maintain order there are also a few Russian officers stationed here.

SKETCH OF THE VILLAGE.—A half dozen convenient wooden houses are here erected, used for warehouses and stores, also for the use of servants of the Russian Government and of the company. The natives live partly in adobe houses, quite roomy and not unpleasant inside; partly in small wooden houses which the company are gradually endeavoring to introduce, instead of turf houses, by yearly importing and giving away a few such houses to the most deserving ones of the inhabitants. A church for Greek-Catholic service is also there, and a roomy schoolhouse intended for children of the Aleutians. Unfortunately, the school was now closed, but to judge from the copybooks which were lying around in the schoolroom, the teaching here is not to be despised. At least the writing proofs were conspicuous for their cleanliness, absence of school blots, and an exceedingly even and beautiful handwriting. At the "colony" the houses are collected in one place in a village, which, from the sea, has the appearance somewhat of a small Norwegian fisherman village. Besides these, a few scattered houses are to be found here and there on other parts of the island, as, for instance, on the northeast side, where cultivation of potatoes is carried on on a small scale, at the hunting place on the north side, where a couple of large warehouses and a number of very

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Bering, in 1741–42. Steller's account and the stories of the survivors drew a large concourse of rapacious hunters to the Commander Islands. They appear, as near as I can arrive at truths from the scanty record, to have quickly exterminated the sea otters, and to have killed many and harassed the other fur seals entirely away from the island, so that there was an interregnum between 1760 and 1786, during which time the Russian promyshleniks took no fur seals and were utterly at loss to know whither these creatures had fled from the islands of Bering and Copper. When they (the seals) began to revisit their haunts on the Commander Islands I can find no specific date, but I am inclined to believe that they did not reappear on Bering and Copper islands, to anything like the number seen by Steller, until 1837–38; perhaps have not done so until quite recently. At least, in 1867 the Russians did not think more than 20,000 skins could be secured there annually, while they declared 100,000 could be taken readily at the Pribilofs. Again, since 1867 the capacity of the Commander group has gradually increased from 15,000 to 20,000, then to 40,000 and 50,000 "holluschickie" per annum. Now, this striking improvement is due, doubtless, to the superior treatment of the whole business by the Alaska Commercial Company, which had also leased these interests from the Russian Government in 1871 for a term of twenty years. I think, therefore, that when the fur seals on the Commander Islands became so ruthlessly hunted and harassed shortly after Steller's observations in 1742, then they soon repaired, or rather most of the survivors did, to the shelter and isolation of the Pribilof group, which was wholly unknown to man; and it remained so until 1786–87. Then succeeded a period between, up to 1842–1845, when the unhappy seals had but little rest or choice between the Commander and the Pribilof islands, and must have sadly diminished, as the record shows, in numbers. The unfortunate overland journey of Steller, which alternately starved and froze him into a low fever that ended his young and promising life in a yourt on the Siberian steppes, November 12, 1745, six years prior to the first publication of his celebrated notes on the "sea bears" of Bering Island, often occurs sadly to my mind in this connection; for, undoubtedly, had he lived then to have reached St. Petersburg, whither he was bound, he would have enlarged and polished these items, which now appear in the Proceedings of the Imperial Academy, 1751, just as he had roughly drafted them in the field May and June, 1742. This revision of his field jottings would have undoubtedly supplied many links now missing to the disconnected history of the seal life on the Commander Islands, as it presents itself to us at this late day.—H. W. E.

small underground houses are to be found, and are used only during the killing season.

DISCOVERY OF THE ISLAND.—Geographically, as well as in regard to natural history, Bering Island is one of the most curious islands in the northern part of the Pacific Ocean. It was here where Bering, after his last disastrous voyage in this sea, which now bears his name, on the 19th of December, 1741, finished his long career as a discoverer, shortly after his ship, during a storm, crushed against the cliffs on the north coast of the island. Many of his fellow-travelers survived him, among them the learned naturalist Steller, who left a masterly description, seldom equaled, of the natural history of this island, where he involuntarily spent his time from the middle of November, 1741, to the end of August, 1742.

As far as is known, Bering Island had never before been visited by man. It was the desire to obtain for our museums the skins and skeletons of the many curious mammiferous animals existing here, as also to compare the present condition of the island, since it has nearly a century and a half been mercilessly exposed to hunting and the cupidity of mankind, with the vivacious and striking description left by Steller, which prompted me to put down on our traveling plan a visit to the island. The news I gathered on Bering Island from American papers about the uneasiness which our wintering in the Arctic had created in Europe really prevented me from remaining here as long as I should have wished; but nevertheless, our collections and observations are exceedingly valuable.

CHANGES SINCE STELLER'S TIME.—Since the time of Steller the animal life has undergone a considerable change on the island. Foxes (or, more correctly, "fjellrackor," Swedish) existed then in unusual numbers. Not alone did they eat up everything that could be eaten at all which was left outside, but they forced themselves in the houses during the day as well as night and carried away anything they could, even articles that could be of no use to them, such as knives, sticks, sacks, shoes, and socks. It became necessary, when doing certain things out of doors, to drive them away with sticks, and at last they became—through the slyness and cunning with which they managed to consummate their thieving, and the cleverness with which they combined their efforts to obtain objects which they alone could not accomplish—really dangerous, mischief-making animals for the castaways. Since then thousands upon thousands have been taken here by fur hunters. Now they are so rare that during our stay here we did not see a single animal. The remaining ones are said not to have the formerly so commonly seen black-blue coat, but the white, which is not very costly. On the neighboring Copper Island there are still considerable numbers of black-blue foxes.

Steller and his fellow-travelers killed here, in 1741–42, 700 sea otters. This animal, known for its very costly and fine fur, is now entirely driven from Bering Island.

Of sea lions, *Otaria stelleri*, which were formerly very numerous, but few now visit this place; also sea bears, *Otaria ursina*, and finally, the most curious of all the former mammalia on Bering Island, the great sea cow, is now altogether extinct.

MARINE "NEAT CATTLE."—Steller's sea cow, *Rhytina stelleri*, took the place, in a certain way, of the hoofed animal among the sea mammalia. It was of a nut-brown color and covered with hair which had grown together into an outer hide, much like the bark of an old oak tree. Its length was, according to Steller, even to 35 feet, and its weight

almost 500 hundredweight. The head was large, neck short, hardly distinguishable, fore part of body very thick, but suddenly narrowing backward. It had two short fore legs, which terminated abruptly without any fingers or nails, but with close-gathered bristle hair. Hind legs were missing altogether and replaced by a tail fin, something like the whale. Teats, which were very rich in milk with the females, had their places between the fore legs. The flesh and milk resembled very much that of neat cattle; it was even better than the latter, according to Steller.

The sea cows were almost constantly occupied in feeding on those seaweeds found in abundance along the coast, in doing which they moved neck and head as an ox. They showed great gluttony, and were not disturbed in the least by the presence of people. It was possible to go up to and even to touch them without their being scared or seeming to mind it. Toward each other they showed great affection, and when one was harpooned the others made unusual efforts to save it.

When Steller was there these animals collected in great herds as neat cattle, grazing everywhere along the shores. A great number were killed by Steller and his companions. Later the hunt for these animals was an important food item for those Russians who sailed from Kamchatka to the Aleutian Islands. Hundreds were killed yearly, and it was soon exterminated, as it existed, if we except a few animals gone astray, at that time only on Bering Island. According to what Middendorf quotes from the very careful researches which the celebrated academicians v. Baer and v. Brandt had made, the sea cow had not been seen before Steller's time, 1741, and the last was said to have been killed in 1768. During the many investigations I made among the natives, I obtained reliable information that the sea cow had been killed much later. A "creole" (i. e., a mixture of Russian and Aleut), who is now 67 years old, of clever appearance and perfect mental condition, said that his father died in 1847, aged 88. The father was from Wolhynien, and came to Bering Island when 18 years of age, that is, in 1777. The first two or three years (that is, 1779 or 1780) after his arrival they used to kill sea cows as they grazed at low-water mark. Only the heart was eaten; the hide was used for bidarrahs. In consequence of its thickness it was split in two parts. Two such split hides were sufficient to cover a bidarrah of 20 feet length, 7½ feet width, and 3 feet depth. After that time none of these animals had been killed.

LAST SIGHT OF SEA COW HERE.—It is surmised that a sea cow had shown itself much later around the island. Two creoles, Teodor Merchenin and Stepnoff, saw, about twenty-five years ago, at Tolstoi Mees, on the east of the island, an animal which they did not know; it was very thick forward and tapered backward, had small forefeet, and showed itself about 15 feet above the water, rising and again sinking. It blew, not through a blowhole, but through its mouth, which was somewhat elongated. Its color was brown, with large light spots. It had no fin on the back, but when it raised itself it was possible to see the vertebræ lumps, in consequence of its very lean condition. I made a very thorough examination of the two talesmen. Their story agreed fully and appeared as if entitled to be given credence.

One of the Alaska Company's hide examiners, Mr. Ohsche, a native of Lifland and for the present living on Copper Island, told me that bones of the sea cow could be found on the west side of Copper Island, in the center. Again, it is said that no bones exist on the little islet

opposite the colony, although bones are plenty on the neighboring beach on the main island. This is the meager information I could gather from the natives and other people residing here about the animal. But I was very fortunate in being able to collect a very large and beautiful assortment of skeleton parts.

NORDENSKIÖLD'S SUCCESS IN GETTING ITS BONES.—When I first made the acquaintance of the Europeans living on the island I was told that there was a very poor show for making any large collections. The company had in vain offered 150 rubles for a skeleton. But after I had been ashore a few hours I already found out that larger and smaller collections of bones were to be found here and there in the huts of the natives. Those I bought, paying purposely for them in such a way that the seller was more than satisfied and his neighbor a little envious. A large portion of the male population now commenced very zealously to hunt for bones, and in this manner I got together twenty-one casks, large boxes, and barrels full of *Rhytina* bones, among them many very extensive bone collections from the same animal, two whole, very pretty, and several more or less damaged skulls, etc.

BONES OF THE EXTINCT SEA COW OF STELLER.—*Rhytina* bones are not lying near the water edge, but on a beach shelf, 6 to 10 feet high, thickly covered with grass. They are usually covered with a layer of earth débris of 1 to 1½ feet thickness, and in order to find them we had to explore the ground with a bayonet or a sharp iron, as it would have been too laborious to dig up the whole grass layer. A person very soon gets accustomed to distinguish, by the sound or the feeling of the bayonet, whether he has struck against a stone, a piece of wood, or a piece of bone.

In consequence of their hard, ivory-like condition, the *Rhytina* bones are used by the natives for sleigh runners and for carvings. They are, therefore, already to a great extent used up and rarer than other bones. The bones from the finger seem in most cases to be entirely destroyed, and the same is the case with the extreme tail parts.

FUR SEALS ON BERING ISLAND.—The only large animal which still exists on the island in, perhaps, as large numbers as at the time of Steller is the sea bear, *Otaria ursina*. Even that had decreased so that the yearly catch was a very inconsiderable one when the Alaska Company obtained the exclusive privilege for hunting by a payment to the Russian Government of, if I remember right, 2 rubles for each animal killed. The hunting was then organized on a more advantageous basis. At certain periods of the year the animals are now altogether unmolested. The number of animals to be killed is settled beforehand, just the same as the farmer in the fall of the year (slaughtering time, Swedish custom) is in the habit of doing with his cattle. After that is done the animals condemned to death are selected, as well as can be done, in a hurry, but animals with poor skins, old females and pups, are liberated. Those numerous flocks of sea bears, which are found on the shores of Bering and Copper islands are, consequently, handled nearly the same as a herd of tame animals. This can only be done in that manner, because the animals are in the habit of spending several months of the year, almost without interruption[1] and without eating any food, on certain long, rocky spits

[1] During a long-continued heavy rain many of the animals are said to seek shelter in the sea, but return as soon as the rain ceases.

running out into the sea from those islands. They congregate here in hundreds of thousands in closely packed flocks on the beach. On those places it is strictly prohibited to hunt the animal or to disturb it during its rest without special permission from the village foreman, who is selected by the Aleuts living on the place. When a number of sea bears are to be killed a flock is surrounded by a sufficient number of hunters and are driven with sticks up on the grass a short distance from the beach. Then females and young ones, and those males whose fur coat is not desirable, are driven away. The remaining ones are stunned first with a blow on the nose and then stabbed with a knife.

INSPECTION OF A ROOKERY.—Accompanied by the village foreman, a black-haired stuttering Aleut, and the "Cossack," a young, neat, and polite man, who on special occasions carries a saber of nearly his own length, but who otherwise not in the least answered to the Cossack type accepted by writers of novels and dramas, a few of us visited a spit sticking out in the sea from the north side of the island, which is a favorite resting place for sea bears. Just at that time there were, in accordance with surely overestimated statements which we received, 200,000 animals congregated at the spit and neighboring beaches. Accompanied by our guides, we received permission to crawl close on to a flock lying a little separate. The older animals were a little uneasy at first when they noticed that we crawled near them, but they very soon settled down again, and we now had the pleasure of a peculiar spectacle. We were the only spectators. The scene consisted of a stone-covered beach wreathed with foaming breakers, the background of the unmeasurable sea, and the actors thousands of curiously formed animals.

A number of old males were lying still and immovable, unconcerned about what went on around them. Others crawled on their short, small legs clumsily among the rocks on the beach, or swam with incredible suppleness among the breakers, playing, cooing with each other, and quarreling. In one place two older animals fought with a peculiar wheezing noise, in a manner as if the fighting had taken place with studied positions for attack and defense. In another, a sham fight between an old animal and a pup. It appeared as if that one was receiving lessons in the art of fencing. Everywhere the little black pups were crawling friskily to and fro between the others, now and then bleating like lambs calling their mothers. Often the pups are crushed by the old, when, scared by some untoward circumstance, they rush out in the sea. Hundreds of dead pups are found after such an alarm on the beach.

Only 13,000 animals had been killed this year. Their skinned carcasses were lying heaped in the grass on the beach, spreading a disagreeable smell far and wide, which after all did not scare their comrades lying on neighboring points, because among them a similar smell prevailed, on account of the many dead animals remaining on the beach, either crushed or dead from natural causes. Among this large herd of sea bears a single sea lion was enthroned on top of a high rock, the only one of those animals which we had seen during our travels.

Against payment of 40 rubles I prevailed on the village chief to prepare for me four skeletons of those half-rotten carcasses lying in the grass, and afterwards I received, through the kindness of the Russian authorities and without any compensation, for stuffing six animals,

among them two live pups. Even those we had to kill, after in vain having tried to make them take food. One of them will be brought home in alcohol for anatomical investigation.

CHARACTER OF BERING ISLAND.—That part of Bering Island which we saw is composed of a plateau resting on volcanic mountains,[1] which in many places is broken by deep canyons. In their bottoms are usually found lakes, which through smaller or larger streams connect with the sea.

The border of the lakes and the mountain slopes are covered with a rich vegetation of long grass and beautiful flowers, among which a sword lily that is cultivated in our gardens, the useful dark-red brown Savannah lily, several orchids, two kinds of rhododendrons, large flowers, umbellifers the height of a man, sunflowers like synanthaus, etc. An entirely different kind of flora prevailed on the islet which lies outside the harbor.

Toporkoff Islet consists of an eruptive rock, which everywhere toward the shores, a few score yards from high-water mark, rises up in the form of abrupt, low, cracked walls from 5 to 10 meters in height, differing in different places. Above those abrupt mountain walls the surface of the island is formed of an even plane. What lies below forms a gradually sloping beach. The gradually sloping beach consists of two well defined belts, an outer one without any vegetation, an inner one overgrown with *Ammadenia peploides*, *Elymus mollis*, and two kinds of umbellates, *Heracleum sibiricum* and *Angelica archangelica*, of which the two last named form an almost impenetrable brush about 50 meters wide, man high, along the shelf. The abrupt mountain walls are in some places yellow colored from the *Caloplacmus murorum* and *C. cremulata*, in other places quite closely clothed with *Cochlearia fenestrata*.

The uppermost even plateau is covered by a luxuriant close grass carpet, over which a few stalks of the two above-named umbellates raise themselves here and there. Vegetation on this little islet combines an unusual poverty of various species with a high degree of luxuriance.

Of higher order of animals we saw only four species of birds, namely, *Fratercula cirrhata*, *Uria grylle*, one species of *Phalacrocorax* (Swedish skafvar), and one kind of the gull (*Larus*) species, which live here by the millions. They occupied the upper plateau, where they had everywhere dug out short, deep, and unusually broad passages, with two openings, in which they slept. From there they flew, on our arrival, in large flocks to and from the sea. Their numbers were almost comparable with the auks on the arctic bird cliffs. The other ducks nestled along the shore cliffs.

The number of the nonvertebrate land animals foots up perhaps to thirty species. The most numerous are Machelis, Vitrina, Lithobias, Talitrus, a few two-winged beetles (bugs). They all lived on the inner belt of the shore, where the ground is unusually damp.

MUCH MILDER CLIMATE THAN THAT OF THE PRIBILOF GROUP.—Bering Island could without difficulty feed large herds of cattle, perhaps as numerous as the herds of sea cows which formerly grazed along its shores. The sea cow had, as it were, chosen its grazing place with

[1] According to Mr. Grebnitsky, tertiary petrifactions and seams of coal are found on Bering, the former north of the colony in the interior of the island, the latter at the water's edge south of Bering's grave. Also, near the colony, the underlayer below trachyte beds is composed of immense sand layers.

discrimination, because the sea about here, according to Dr. Kjelman, is one of the richest kelp places in the world. The bottom of the sea is covered in favorable places with kelp forests from 60 to 100 feet high, which are so dense that the scraper with difficulty penetrates down in them, a circumstance which made the dredging exceedingly difficult. Certain kind of kelp is used by the inhabitants for food.

SALMON ON THE ISLAND.—That spit, where the sea bears have their rookeries, is about 20 kilometers distant from the village. We went there each on his sleigh drawn by about ten dogs. During this trip, at a resting place halfway between the village and the rookeries, we had occasion to take part in a very peculiar fishing. Our halting place was on an even grass meadow, cut through by innumerable brooks. These were full of various kinds of fishes, among them a kind of siik (gwiniad, Swedish), a small trout (forell), a medium-sized salmon, with almost white meat, but with purple-red skin, and another of about the same length, but very broad and with a hump on the back. These were easily taken. They were taken by hand, harpooned with an ordinary blunt stick, or any piece of wood, cut with knives, or taken with a bug scoop. Other kinds of salmon, with very highly colored red flesh, are found in the larger streams on the island. We received here, for a mere nothing, a welcome change from the preserved food with which we had long ago become thoroughly disgusted.

COURTESY OF THE ALASKA COMMERCIAL COMPANY.—Besides that, the expedition received, as a gift from the Alaska Company, fat and splendid beeves, milk, and other refreshments, and I can not sufficiently praise the good will we experienced, as well from the Russian official, Mr. Grebnitsky, an energetic and skillful student of natural history, as from the employees of the Alaska Company and all other persons living on the island with whom we came in contact. (Translation closes.)

TABLE SUBMITTED BY THE AUTHOR, SHOWING THE "CATCH" ON THE COMMANDER ISLANDS.—In order to show the relative importance of the seal business on these Russian islands as compared with that of our own, I append the following exhibit of what has been done there since 1862. Professor Nordenskiöld does not seem to have gathered the information. He has, however, in his forthcoming Vegás-färden embodied my figures.

Fur-seal skins taken for shipment from the Commander Islands.

Years.	Number of seals taken.	Years.	Number of seals taken.	Years.	Number of seals taken.
1862	4,000	1869	24,000	1876	26,960
1863	4,500	1870	24,000	1877	21,532
1864	5,000	1871	3,614	1878	31,340
1865	4,000	1872	29,318	1879	42,752
1866	4,000	1873	30,396	1880	48,504
1867	4,000	1874	31,272		
1868	12,000	1875	36,274	Total, 1862 to 1880	387,462

BERING'S DISASTER.—The miserable ending to Bering's voyage of discovery in 1741–42 had one redeeming clause. The shipwreck of the commander's vessel gave Steller his opportunity of making the fur-seal rookeries known to man for the first time, in either history or legend. As the prime factor of this entertaining addition to our knowledge, I think a short recital of the misfortunes of the Russian

expedition interesting in the relation which it bears to the subject of my discussion.

HOMEWARD VOYAGE AND SHIPWRECK.—In 1741, June 4, Bering and Tschericov set sail from Petropavlovsky in two small vessels, the *St. Peter* and the *St. Paul;* they proceeded as low as 50° latitude, then decided to steer eastward for the reported American continent. On the 20th the rude ships were separated by a storm, and the two commanders never met in life again. Sunday, July 18, Bering, while waiting for the other vessel, drifted on our northwest coast. He passed some six weeks in the new waters of his discovery, when by the 3d of September a violent storm occurred and lasted seven days, driving them back to 48° 18′ north latitude and into the lonely wastes of the vast Pacific. The scurvy began to appear on board; hardly a day passed without the death of one of the crew, and men enough in health were scarcely left to manage the ship. A return to Kamchatka was resolved upon. Bering became morose and seldom appeared on deck, and the second in command, Stoörman Vachtel, directed the dreary cruise. After regaining the land and burying a sailor named Shumagin on one of the group of Alaskan islets that bear this title to-day, and discovering and naming several Aleutian capes and islands, they saw two, which by an unfortunate blunder, they took for the Kuriles, adjacent to Kamchatka; thus they erred sadly in their reckoning and sailed out on a point of false departure. In vain they craned their necks for the land. The shore of Kamchatka refused to rise, and soon there was no hope of making a port in that goal so late in the year. The wonderful discipline of the Russian sailors was strikingly exhibited at this stage of the luckless voyage; notwithstanding their fearfully debilitated condition, and suffering from cold and wet, they obeyed orders and attended to their duties. We are told by Steller that the scurvy had already so far advanced that the steersman was conducted to the helm by two other invalids who happened to have the use of their legs and who supported him under the arms; when he could no longer steer from suffering, he was succeeded by another no better able to execute the labor than himself; thus did the unhappy crew waste away into death; they were obliged to carry few sails, for they had not hands to reef them, and such as they had were nearly worn out, and in this case they could not be replaced from the stores, since there were no seamen strong enough on the ship to bend new ones to the yards and booms.

Soon rain was followed by snow, the nights grew longer and darker, and now they lived in dreadful anticipation of shipwreck; the fresh water diminished, and the labor of working the vessel became too severe for the few who were able to be about. From the 1st to the 4th of November the ship had lain as a log on the ocean, helpless, and drifting at the sport of the wind and the waves. Then, again, they managed to control her and set her course anew to the westward, without knowing absolutely anything as to where they were. In a few hours after the joy of the distressed crew can be better imagined than described, for they saw the tops of high hills, still at a great distance ahead, covered with snow. As they drew nearer, night came upon them, and they judged best therefore to keep out, "off and on," until daybreak, so as to avoid the risk of wrecking themselves in the dark. In the morning they found that the rigging on the starboard side of the vessel was giving away and the craft could not be managed much longer; that the water was very low, and the sickness increasing frightfully. The humidity of the climate was now succeeded by

intense cold. Life was well-nigh insupportable on ship then, and they determined to make for the land to save their lives, and, if possible, safely beach the *St. Peter*.

The small sails were alone set; the wind was north; the depth of water 36 fathoms, sand bottom; two hours after they decreased it to 12; they now contrived to get over an anchor and run it at three-quarters of a cable's length; at 6 p. m. the hawser parted and tremendous waves bore the helpless boat through the darkness and the storm in to the coast, where soon she struck twice upon a rocky reef. Yet in a moment after they had 5 fathoms of water; a second anchor was thrown out and again the tackle parted; and while in the energy of wild despair they were preparing a third bower, a huge combing wave lifted that ark of misery, of superlative human suffering, safely and sheer over the reef, where in an instant she lay in calm water. The last anchor was put out, and the voyage of Bering came to an end in 4 fathoms of water over a sandy bottom and only 300 fathoms from the beach. In the morning they found that they had drifted in here at the only spot where they possibly could have been carried over a ridge of rocks—that 20 fathoms distance right or left of their course high basaltic bowlders and jagged pinnacles arose from the sea, against which they must have perished had they struck during the fury of the gale and the darkness of the night.

THE EXHAUSTED RUSSIANS LAND.—Winter was now at hand. The crew, worn down with excitement, fatigue, and disease, reposed until midday, then lowered the boat; on the 6th of November Vachtel landed. They found the country barren and covered with snow. A clear stream of excellent water, not frozen, ran down from the hills to the shore; no trees or even shrubs were visible; firewood was driftwood on the beaches, so it had to be dug from under snow and icy fetters; shelter there was none, but they found near the open mouth of the little creek some sand walls and deep wind-scraped hollows therein; these they cleared out and covered over with the ship's sails to serve as a temporary shelter until they could build a wooden cabin. On the 8th of November the sand caves were prepared and the sick taken from the *St. Peter* and placed in them. Steller, the undaunted surgeon and naturalist, tells us that some of them died on being brought up from the wardroom below, others in the boat, and others soon after landing—the violent change of air snapped the slender threads remaining that bound them to this life. The bodies of the dead were instantly attacked by foxes, *Vulpes lagopus*, which came down suddenly to their strange prey without fear, apparently never having seen man, and were so bold that they actually mangled the feet and heads of the dead Russians ere the living could bury them.

MELANCHOLY INCIDENTS OF BERING'S DEATH.—On the 9th of November Bering himself was brought ashore, well shielded from the atmosphere and put into a sand hollow all by himself; of the officers, he alone died. His age and temperament inclined him to inactivity; he became delirious and cunning, taking his friends to be his enemies, some of whom, including Steller, could not come into his presence during his last illness. He used to amuse himself by detaching the sand from the sides of the place where he lay, so that he soon covered his lower limbs entirely with it. Those who attended him cleared it away at first, but finally he would not suffer them to do so, and showed impotent anger while they made the attempt. When he died at last, just thirty days after being brought ashore, he was almost buried by his own hands in the sandy bed of his death. They

interred him near the spot, and the island is his monument, and also the imperishable record of his singular end.

Steller says that those who survived were those who resisted the desire to take to their beds, and whose natural flow of humor kept them sanguine and cheerful. The officers who had to be on deck and up at all hours looking after everything were never taken down seriously, though they all were attacked by scurvy. Not long after Bering died the *St. Peter* was wrecked by a fearful southeaster. Her cable parted and she came ashore near by the Russian encampment during the night of December 29. In the morning she was found buried 8 or 10 feet in the sand, completely shattered. This was a crushing blow to the survivors—they had counted alone on getting back to Petropavlovsky by her instrumentality.

ESCAPE OF THE SURVIVORS.—The survivors, 45 souls, lived through the winter on the flesh of sea lions, the *Rhytina* or manatee, and thus saved their flour, etc. They managed to build a little shallop out of the remains of the *St. Peter*, in which they left this scene of the most extraordinary shipwreck and deliverance in our annals, on the 16th of August, 1742, and reached Petropavlovsky in safety on the 27th.

THE NERVE AND COURAGE OF STELLER.—Steller here saw the fur seal breeding first of all civilized men, in the waters north of the equator, and here he made the earliest record of its existence as an animal in the naturalist's lexicon. The rookery to and from which he used to journey in observation was nearly 9 miles from the camp, and considering his physical condition—he was never a robust man—the fatigue that his excursions must have engendered would have deterred most men from making a second trip to the "laasbustchie" of Bering Island.

As our intelligence and appreciation of these valuable interests of natural science and of commerce peculiar to the Pribilof group of Alaska and the Commander Islands of Russia increases, so do our regard and esteem for Steller advance. Since he was the surgeon of that ill-fated expedition, his duties in this direction must have consumed nearly all of his time in the most imperative manner. What he did do, therefore, in the line of natural history is still the more to be commended.

ST. MATTHEW ISLAND AND ITS RELATION TO ST. PAUL.

POLAR BEARS ON THE PRIBILOF GROUP.—When the fur seals first took possession of the Pribilof group they undoubtedly found polar bears thereon. At least I firmly believe that if the bears were not about when they first arrived it was not due to the inability of these creatures to get there in limited numbers, but rather to the fact that nothing on the islands invited them or was as attractive as the field to the north, for this animal can not endure with comfort a temperature which even the fur seal will submit to.

Provided with more walrus meat than he knew what to do with, the polar bear, in my opinion, has never cared much for the seal islands; but the natives have seen them here on St. Paul, and old men have their bear stories which they tell to the rising generation. The last "medvait" killed on St. Paul Island was shot at Boga Slov in 1848. None have ever come down since and very few were there before, but those few evidently originated at and made St. Matthew Island their point of departure. Hence I desire to notice this hitherto unexplored spot, standing as it does 200 miles to the northward of St. Paul, and

which, until Lieutenant Maynard and myself in 1874 surveyed and walked over its entire coast line, had not been trodden, by white men or by natives, since that dismal record made by a party of five Russians and seven Aleuts who passed the winter of 1810–11 on it and who were so stricken down with scurvy as to cause the death of all the Russians save one, while the rest barely recovered and left early the following year. We found the ruins of the huts which had been occupied by this unfortunate and discomfited party of fur hunters who were landed there to secure polar bears in the depth of winter, when such ursine coats should be the finest.

TOPOGRAPHY OF ST. MATTHEW ISLAND.—St. Matthew Island is a queer, jagged, straggling reach of bluffs and headlands, connected by bars and lowland spits. The former, seen at a little distance out at sea, resemble half a dozen distinct islands. The extreme length is 22 miles and it is exceedingly narrow in proportion. Hall Island is a small one that lies west from it, separated from it by a strait (Sarichev) less than 3 miles in width, while the only other outlying land is a sharp, jagged pinnacle rock, rearing itself over 1,000 feet abruptly from the sea, standing 5 miles south of Sugar Loaf Cone on the main Island. From the cleft and blackened fissure near the summit of this serrated pinnacle rock volcanic fire and puffs of black smoke have been recorded as issuing.

Our first landing, early in the morning of August 5, was at the slope of Cub Hill, near Cape Upright, the easternmost point of the island. The air, coming out from the northwest, was cold and chilly, and snow and ice were on the hillsides and in the gullies. The sloping sides and summits of the hills were of a grayish, russet tinge, with deep green swale flats running down into the lowlands, which are there more intensely green and warmer in tone. The pebble bar, formed by the sea between Cape Upright and Waterfall Head, is covered with a deep stratum of glacial drift, carried down from the flanks of Polar and Cub hills and extending over 2 miles of this water front to the westward, where it is met by a similar washing from that quarter. Back and in the center of this neck are several small lakes and lagoons, without fish; but emptying into them are a number of clear, lively brooks, in which were salmon parr of fine quality. The little lakes undoubtedly receive them, and hence they were land-locked salmon. A luxuriant growth of thick moss and grass, interspersed, existed almost everywhere on the lowest ground, and occasionally strange dome-like piles of peat were lifted 4 or 5 feet above the marshy swale and appeared so remarkably like abandoned barrabaras that we repeatedly turned from our course personally to satisfy ourselves to the contrary.

CHANGING VEGETATION.—As these lowlands ascend to the tops of the hills the vegetation changes rapidly to a simple coat of cryptogamic gray and light russet, with a slippery slide for the foot wherever a steep flight or climbing was made. Water oozes and trickles everywhere under foot, since an exhalation of frost is in progress all the time. Sometimes the swales rise and cross the hill summits to the valleys again, without any interruption in their wet, swampy character.

LAIRS OF THE POLAR BEAR.—Here, on the highest points, where no moss ever grows and nothing but a fine porphyritic shingle slides and rattles beneath our tread, are bear roads leading from nest to nest, or lairs, which they have scooped out of frost-splintered rocks on the hillsides, and where the she bears undoubtedly bring forth their young;

but it is not plain, because we saw them only sleeping, at this season of the year, on the lower ground, seemingly to delight in stretching themselves and rolling over the rankest vegetation.

GLACIAL EXHIBITS.—The action of ice in rounding down and grinding hills, chipping bluffs, and chiseling everywhere, carrying the soil and débris into depressions and valleys, is most beautifully exhibited on St. Matthew. The hills at the foot of Sugar Loaf Cone are bare and literally polished by ice sheets and slides of melting snow. The rocks and soil from the summits and slopes are carried down and "dumped," as it were, in numberless little heaps at the base, so that the foot of the hill and out on the plain around strongly put us in mind of those refuse piles which are dropped over the commons or dumping grounds of a city. Nowhere can the work of ice be seen to better advantage than here, aided and abetted as it undoubtedly is by the power of wind, especially with regard to the chiseling action of frost on the faces of the ringing, metallic, porphyry cliffs.

EXTENSIVE FLORA.—The flora here is as extensive as on the seal islands, 200 miles to the southward, but the species of *grammæ* are not nearly so varied; indeed, there is very little grass around about. Wherever there is soil it seems to be converted by the abundant moisture into a swale or swamp, over which we traveled as on a quaking water bed; but on the rounded hilltops and ridge summits the wind-rubbed and frost-splintered shingle makes good walking. Both of these climatic agencies evidently have an annual iron grip on the island.

FANTASTIC CLEAVAGE OF THE ROCKS.—The west end of St. Matthew differs materially from the east. The fantastic weathering of the rocks at Cathedral Point, Hall Island, will strike the eye of a most casual observer as the ship enters the straits going south. This eastern wall of that point looms up from the water like a row of immense cedar-tree trunks. The scaling off of the basaltic porphyry and growth of yellowish-green and red, mossy lichens made the effect most real, while a vast bank of fog lying just overhead seemed to shut out from our vision the foliage and branches that should be above. This north cape of Hall Island changes when approached with every mile's distance to a new and altogether characteristic profile.

Our visit at the west end of the island of St. Matthew was, geologically speaking, the most interesting experience I have ever had in Alaska. The geologist who may desire to study the greatest variety of igneous forms in situ within a short and easy radius can do no better than make his survey here. The rocks are not only varied by mineral colors, together with a fantastic arrangement of basalt and porphyry, but are rich and elegant in their tinting by the profuse growth of lichens—brown, yellow, green, and bronze.

HUNDREDS OF POLAR BEARS.—An old Russian record prepared us in landing to find bears here, but it did not cause us to be equal to the sight we saw, for we met bears—yea, hundreds of them. I was going to say that I saw bears here as I had seen seals to the south, but that, of course, will not do, unless as a mere figure of speech. During the nine days that we were surveying this island we never were one moment while on land out of sight of a bear or bears. Their white forms in the distance always answered to our search, though they ran from our immediate presence with the greatest celerity, traveling in a swift, shambling gallop or trotting off like elephants. Whether due to the fact that they were gorged with food or that the warmer weather of summer subdued their temper, we never could coax one of these

animals to show fight. Its first impulse and its last one while within our influence was flight—males, females, and cubs, all, when surprised by us, rushing with one accord right, left, and in every direction over the hills and away.

After shooting half a dozen we destroyed no more, for we speedily found that we had made their acquaintance at the height of their shedding season; and their snowy and highly prized winter dress was a very different article from the dingy, saffron-colored, grayish fur that was flying like downy feathers in the wind whenever rubbed or pulled by our hands. They never roared, or uttered any sound whatever, even when shot or wounded.

EXCELLENCE OF THE FLESH.—Let me testify at this moment to the excellent quality of polar-bear steak. We gave it a fair trial, and it conquered all our prejudices—mine in especial, because I had been victimized with black-bear meat many years before, in British Columbia.

IMMENSE SIZE OF THE POLAR BEAR.—These bears impressed me greatly by their enormous size. One, shot by Lieutenant Maynard, measured exactly 8 feet from the tip of its nose to its excessively short tail, and could not have weighed less than 1,000 or 1,200 pounds. It had a girth of 24 inches around the muscles of the forearm alone, at the place where the skin was removed and the foot cut off just back of the carpal joint, that corresponds to our wrist. This animal was very fat, and its head was scarred all over with wounds, evidently received in fighting with its kind. No worms were found in the intestines and stomach; the liver was speckled with light grayish green dots, and normal. Many of them were seen grazing and rooting like hogs on a common.

FITFUL SLEEP OF BEARS.—They sleep soundly, but fitfully, rolling their heavy arms and legs about as they doze. For naps they seem to prefer little grassy depressions on the sunny hillsides and along the numerous water courses, and their paths were broad and well beaten all over the island. We could not have observed less than 250 or 300 of these animals while we were there. At one landing on Hall Island there were 16, scampering up and off from the approach of the ship's boat, at one sweep of our eyes.

FUR SEALS CAN NOT LAND HERE.—The chief attraction to these bears, undoubtedly, at St. Matthew, is the walrus herds; and the island's special adaptation by its position to a possibility of its ever being resorted to by the fur seal was the reason of my visit; and the result of my careful examination shows conclusively that the character of the gravel spits and necks, which are the only landing grounds offered, is such as not to be fit for the reception of breeding seals, as they would be speedily converted by them into a sheet of mud and slime; and there is no other ground presented save at the base of cliffs everywhere rising up from the sea. Seals, also, if they could land here independent of this polar-bear scourge, which owns and controls St. Matthew, would find a climate that keeps snow and ice on the beaches until late in June, and still later; hence, I am well satisfied that the fur seals have never visited this desolate land, nor will they ever rest upon it.[1]

[1] This survey made by Lieutenant Maynard and myself is the first careful exploration of the island. The only work hitherto done was the approximate charting of its coast from the decks of Cook's and Billings's and Bering's vessels. Maynard and myself made a detailed plotting of the island, and gave a copy to the United States Coast Survey in August, 1874.

DIGEST OF THE DATA IN REGARD TO THE FUR-SEAL ROOKERIES OF THE SOUTH ATLANTIC AND PACIFIC, AND NUMBER OF SKINS TAKEN THEREFROM.

DIFFICULTY OF FINDING CREDIBLE RECORDS.—Before I introduce the reader to this subject, I desire to call his attention to the source from which nearly all the information which we have touching it is derived. It comes from the verbal and written statements of whalers and other seafaring men. The great difficulty which faces me as I attempt to make up this digest from such authority is the fact that I know the failing of sailors too well—am too conversant with their habits of loose and positively erroneous narration. For instance, as an illustration of this trouble, suppose A had taken a large cargo of fur-seal skins from the Crozette Islands some time in 1820–1825, and when on the homeward stretch had been met at sea by B, another whaler or sealer; A would invariably tell B, in answer to queries as to where he got his catch, that he secured the seals at any other island far away from the real source of supply, in order that he might turn B aside and have a clear field, and a full ship at the Crozettes again when he should discharge at home and return. The story, however, would probably get into circulation, and into print, perhaps; and to-day is misleading us, just as it did B long ago.

SCANTY RECORDS.—If anybody doubts the correctness of my statement, made in the prefatory words of this monograph, to wit, that though a sealing fleet of hundreds of vessels and thousands of men had repaired to the rookeries of the southern oceans, and had annually returned laden with the skins of the *Arctocephalus*, still not a definite line as to the true result—i. e., the number of skins taken from those great Antarctic breeding grounds—can be found in any writing, let him turn to the laborious work of Allen, who for eight or nine long years has ransacked the writings and the musty records of a century back, and see in his history of the North American pinnipeds the pitiful sum of knowledge which he has gathered in regard to the subject.[1] Prior to the tedious research and publication just referred to, in looking toward the same end, I gathered substantially as much information in the Encyclopedia Britannica and in Hamilton's Amphibious Mammalia.[2] But the amount of this information is so abortive and faulty that I hesitate to reprint it here; yet perhaps its republication, together with the equally brief and indefinite compilation of Allen, may draw out from some unexpected quarter further knowledge. Hence I submit the following:

DESTRUCTION OF THE FUR SEALS FOR THEIR PELTRIES.

The value of the peltries of the fur seal has led to wholesale destruction, amounting at some localities almost to extermination. The traffic in their skins appears to have begun toward the end of the last century. Captain Fanning, of the ship *Betsey*, of New York, obtained a full cargo of choice fur-seal skins at the island of Masafuera, on the coast of Chile, in 1798, which he took to the Canton market. Captain Fanning states that on leaving the island, after procuring his cargo, he estimated there were still left on the island between 500,000 and 700,000 fur seals, and adds that subsequently little less than 1,000,000 of fur-seal skins were taken at the island of Masafuera alone,[3] a small islet of not over 25 miles in circumference,

[1] Allen: History North American Pinnipeds, 1880, pp. 229, 230.
[2] Edinburgh, 1839.
[3] Fanning: Voyages to the South Sea, etc., pp. 117, 118. Allen: North American Pinnipeds.

and shipped to Canton.[1] Captain Scammon states that the sealing fleet off the coast of Chile in 1801 amounted to thirty vessels, many of which were ships of the larger class, and nearly all carried the American flag. Notwithstanding this great slaughter, it appears that fur seals continued to exist there as late as 1815, when Captain Fanning again obtained them at this island.[2]

In the year 1800 the fur-seal business appears to have been at its height at the Georgian Islands, where, in the single season, 112,000 fur seals are reported to have been taken, of which 57,000 were secured by a single American vessel (the *Aspasia*, under Captain Fanning). Vancouver, at about this date, reported the existence of large numbers of fur seals on the southwest coast of New Holland. Attention was at once turned to this new field, and in 1804 the brig *Union*, of New York, Capt. Isaac Pendleton, visited this part of the Australian coast, but not finding these animals there in satisfactory numbers, repaired to Border's Island, where he secured only part of a cargo (14,000 skins), owing to the lateness of the season. Later 60,000 were obtained at Antipodes Island. About 1806 the American ship *Catharine*, of New York (Capt. H. Fanning), visited the Crozette Islands, where they landed, and found vast numbers of fur seals, but obtained their cargo from Prince Edward Island, situated a few hundred miles southeast of the Cape of Good Hope, where other vessels the same year obtained full cargoes.

In 1830 the supply of fur seals in the southern seas had so greatly decreased that the vessels engaged in this enterprise "generally made losing voyages, from the fact that those places which were the resort of seals," says Capt. Benjamin Pendleton, "had been abandoned by them or cut off from them," so that the discovery of new sealing grounds was needed. Undiscovered resorts were believed to exist, from the fact that large numbers of fur seals were seen while cruising far out at sea, which must repair once a year to some favorite breeding station.[3]

Captain Weddell states that during the years 1820 and 1821 over 300,000 fur seals were taken at the South Shetland Islands alone, and that at the end of the second year the species had there become almost exterminated. In addition to the number killed for their furs, he estimates that not less than 100,000 newly-born young died in consequence of the destruction of their mothers.

So indiscriminate was the slaughter that whenever a seal reached the beach, of whatever denomination, it was immediately killed. Mr. Scott states, on the authority of Mr. Morris, an experienced sealer, that a like indiscriminate killing was carried on at Antipodes Island, off the coast of New South Wales, from which island alone not less than 400,000 skins were obtained during the years 1814 and 1815. A single ship is said to have taken home 100,000 in bulk, which, through lack of care in curing, spoiled on the way, and on the arrival of the ship in London the skins were dug out of the hold and sold as manure! At about the same time there was a similar wasteful and indiscriminate slaughter of fur seals at the Aleutian Islands, where for some years they were killed at the rate of 200,000 a year, glutting the market to such an extent that the skins did not bring enough to defray the expenses of transportation. Later, the destruction of fur seals at these islands was placed under rigid restrictions (see *infra* the general history of the northern fur seal), in consequence of which undue decrease has been wisely prevented. But nowhere else has there been a systematic protection of the fur seals or any measures taken to prevent wasteful or undue destruction.

THE SUBJECT IN 1873.—The above embodies Allen's gleaning of all that he could learn touching the subject. In 1873 I published the following:

The Government of Buenos Ayres has, from the first, protected and cared for a small rookery of fur seals under the bluffs at Cabo Corrientes, on its coast, where some 5,000 to 8,000 are annually taken, but the seals here have no hauling grounds like those on St. Paul; they are taken with much labor under the high cliffs of this portion of the coast. This is the only government aid and care that the seals have ever received outside of Bering Sea. The following extract shows the way in which the fur seals of the south came into notice:

"Soon after Captain Cook's voyage in the *Resolution*, performed in 1771, he presented an official report concerning New Georgia, in which he gave an account of the great number of elephant seals and fur seals which he had found on the shores of that island. This induced several enterprising merchants to fit out vessels to

[1] Fanning: Voyages to the South Sea, etc., p. 364. Allen: North American Pinnipeds.

[2] Ib., p. 299.

[3] Fanning: Voyages, p. 487.

take them; the former for their oil, the latter for their skins. Captain Weddell states that he had been credibly informed that during a period of about fifty years not less than 20,000 tons of oil were procured annually from this spot alone for the London market, which, at a moderate price, would yield about £1,000,000 a year.

"Seal skins are very much used in their raw state as articles of apparel by the natives of the polar zones; when tanned they are used extensively in making shoes, and the Eskimo have a process by which they make them waterproof (?), so that, according to Scoresby, the jackets and trousers made of them by these people are in great request among the whale fishers for preserving them from oil and wet. But the skins are not only used in this raw and tanned state as leather; on account of their silky and downy covering they constitute still more important articles connected with the fur trade. Thus considered, seal skins are of two kinds, which may be distinguished as hair skins and fur skins. The former are used as clothing and ornament by the Russians, Chinese, and other nations, and the latter yield a fur which we believe exceeds in value all others which have been brought into the market. Many seals supply nothing but hair, while others in different proportions produce both the hair and, underneath it, soft and downy fur. The majority, we believe, are to be considered merely as hair skins, similar to the bear or sable, and of these some are excellent of their kind and much prized." (Hamilton: Amphibious Mammalia, Edinburgh, 1839.)

It may be considered superfluous to read a lecture to the trader upon a matter so nearly touching his own interest, and yet there is one point, at the same time, which forms so essential a part of my subject that I can not withhold a word or two. These valuable creatures (fur seals) have often been found frequenting some sterile islands in innumerable multitudes. By way of illustration, I shall refer only to the fur seal as occurring in South Shetland. On this barren spot their numbers were such that it has been estimated that it could have continued permanently to furnish a return of 100,000 furs a year, which, to say nothing of the public benefit, would have yielded annually a very handsome sum to the adventurers. But what do these men do? In two short years, 1821 and 1822, so great is the rush that they destroy 320,000. They killed all, and spared none. The moment an animal landed, though big with young, it was destroyed. Those on shore were likewise immediately dispatched, though the cubs were but a day old. These, of course, all died, their number, at the lowest calculation, exceeding 100,000. No wonder, then, at the end of the second year the animals in this locality were nearly extinct. So is it in other localties, and so with other seals, and so with the oil seals, and so with the whale itself, every addition only making bad worse. All this might easily be prevented by a little less barbarous and revolting cruelty, and by a little more enlightened selfishness.

With regard to this seal fishery of the south, the English and Americans have exclusively divided it between them, and with very great profits. It has lately been stated (1839) that they together employ not fewer than sixty vessels in the trade, of from 250 to 300 tons burden. These vessels are strongly built, and have each six boats, like those of the whalers, together with a small vessel of 40 tons, which is put in requisition when they reach the scene of their operations. The crew consists of about 24 hands, their object being to select a fixed locality from which to make their various bateaux. Thus it is very common for the ship to be moored in some secure bay and be partially unrigged, while at the same time the furnaces, try pots, etc., required for making the oil are placed on shore. The little cutter is then rigged and manned with about half the crew, who sail about the neighboring islands and send a few men here and there on shore, where they may see seals or wish to watch for them. The campaign frequently lasts for three years, and in the midst of unheard-of privations and dangers. Some of the crew are sometimes left on distant, barren spots, the others being driven off by storms. They are left to perish or drag out for years a most precarious and wretched existence.[1]

With regard to the manner in which fur sealing was carried on then, we find in the Encyclopædia Britannica the following facts:

From about the year 1806 till 1823 an extensive trade was carried on in the south seas in procuring seal skins. These were obtained in vast abundance by the first traders and yielded a very large profit. The time was when cargoes of those skins yielded $5 or $6 apiece in China, and the present price in the English market averages from 30 to 50 shillings per skin. The number of skins brought off from Georgia can not be estimated at fewer than 1,200,000; the Island of Desolation has

[1] Robert Hamilton: Amphibious Mammalia, Edinburgh, 1839.

been equally productive, and, in addition to the vast sums of money which these creatures have yielded, it is calculated that several thousand tons of shipping have annually been employed in the traffic.[1]

EXTERMINATION, THE RESULT.—This gives a very fair idea of the manner in which the business was conducted in the South Pacific. How long would our sealing interests in Bering Sea withstand the attacks of such a fleet of sixty vessels, carrying from twenty to thirty men each? Not over two seasons. The fact that these great southern rookeries withstood and paid for attacks of this extensive character during a period of more than twenty years speaks eloquently of the millions upon millions that must have existed in the waters now almost deserted by them.

EARLY AUTHORITIES ON THE APPEARANCE OF THE FUR SEAL.—Whenever I have followed the records made by navigators of any one of these several islands in the Antarctic, from whence hundreds of thousands of fur seals are said to have been annually taken, I have never found anything in the line of circumstantial evidence of the fact. For instance, had any vast rookery, such as is the one at Northeast Point, St. Paul Island, been in existence at Masafuera or Juan Fernandez, when they were visited by William Dampier in 1683, by Wood-Rogers in 1709, in 1740 and 1767 by Anson and Carteret, surely the extraordinary spectacle must have provoked their attention and description. So far from hinting at any such congregation of massed seal life on the land, they, on the contrary, have more to say in regard to the wild goats which they found there, with the single exception of Dampier. Those were the progeny of the original stock left on the islands by Spanish pirates, long before (1563–1566). I select these two islands for especial reference in this connection, because they had been well known to seamen before the hunting of the fur seal was a recognized business, and described by them. According to the accounts of the sealers, they were the source of several of the largest cargoes of fur-seal skins that were ever taken from any one or two places south of the equator.

ANSON'S VOYAGE, 1740–41.—The best description of Juan Fernandez, written prior to the ravages of the seal-hunting fleet (1800–1813), is the personal account made of it by Richard Walter, the chaplain to Lord Anson's flagship, the *Centurion*, who lived ashore there for three months, June to September, 1741. Anson's fleet of seven "caravels" was dispersed by a fearful storm in rounding the Horn, and the crews were well nigh exterminated by scurvy. Only four of the vessels succeeded in joining him here, which was the preordained rendezvous; and the ninety days in camp at Juan Fernandez were passed in recuperation of the men and refitting the shattered ships.

REMARKABLE PHYSICAL CONTRAST BETWEEN ARCTIC AND ANTARCTIC ROOKERIES.—I offer this description, by Chaplain Walter, of these celebrated southern sealing grounds, as an interesting statement for comparison with that which I have given of the Pribilof group. Certainly the ultra difference in natural character between St. Paul and St. George at the north and Crusoe's Isle and Masafuera on the south is strongly defined and remarkable. The ground-trailing or creeping willow (*Salix reticulata*) of Bering Sea is the only tree or shrub that the fur seal can rub against on the Pribilof Islands, but his southern brother is acquainted with the shadow of the cabbage palm. The following is a copy of Walter's picture, drawn from life, and it is a very graphic one:

[1] Elliott: Condition of Affairs in Alaska, page 261.

DESCRIPTION OF JUAN FERNANDEZ.—However, on the 10th of June, in the afternoon, we got under the lee of the island, and kept ranging along it at about 2 miles distance, in order to look out for the proper anchorage, which was described to be in a bay on the north side. Being now nearer in with the shore, we could discover that the broken, craggy precipices, which had appeared so unpromising at a distance, were far from barren, being in most places covered with woods, and that between them there were everywhere interspersed the finest valleys, covered with a most beautiful verdure and watered with numerous streams and cascades, no valley of any kind being unprovided with its proper rill. * * * At 4 in the morning our cutter was dispatched with our third lieutenant to find out the bay we were in search of, who returned again at noon with the boat laden with seals and grass, for although the island abounded with better vegetables, yet the boat's crew in their short stay had not met with them, and they well knew that even grass would prove a dainty, as, indeed, it was all soon eagerly devoured. [They were ill with scurvy.—H. W. E.] The seals, too, were considered as fresh provisions, but as yet were not much admired, though they grew afterward into more repute, for what rendered them less valuable at this juncture was the prodigious quantity of excellent fish which the people aboard had taken during the absence of the boat.

The island of Juan Fernandez lies in the latitude of 33° 40′ south, and it is 110 leagues distant from the continent of Chile. It is said to have received its name from a Spaniard who formerly procured a grant of it and resided there some time with a view of settling on it, but afterward abandoned it. * * * The island is of an irregular figure. * * * Its greatest extent is between 4 and 5 leagues, and its greatest breadth somewhere short of 2 leagues. The only safe anchorage at this island is at the north side.

The northern part of this island is composed of high, craggy hills, many of them inaccessible, though generally covered with trees. The soil of this part is loose and shallow, so that very large trees on the hills soon perish for want of root, and are then easily overturned. * * * The southern or rather the southwestern part of the island, as distinguished in the plan, is widely different from the rest, being dry, stony, and destitute of trees, and very flat and low compared with the hills on the northern part. This part of the island is never frequented by ships, being surrounded by a steep shore and having little or no fresh water, and besides it is exposed to the southerly wind, which generally blows here the whole year round, and on the winter solstice very hard.

VEGETATION OF JUAN FERNANDEZ.—The trees of which the woods on the northern side of the island are composed are most of them aromatics and of many different sorts. There are none of them of a size to yield any considerable timber except the myrtle trees, which are the largest on the island and supplied us with all the timber we made use of. But even these would not work to a greater length than 40 feet. The top of the myrtle tree is circular and appears as if it had been clipped by art. It bears on its bark an excrescence like moss, which in taste and smell resembles garlic, and was used by our people instead of it. We found here, too, the plemento (palmetto ?) tree, and likewise the cabbage tree, though in no great plenty, and, besides, a great number of plants of various kinds which we were not botanists enough either to describe or attend to.

To the vegetables I have already mentioned, of which we made perpetual use, I must add that we found many acres of ground covered with oats and clover. There were also some few cabbage trees upon the island, as was observed before, but as they generally grew upon the precipices and in dangerous situations, and as it was necessary to cut a large tree for every single cabbage, this was a dainty that we were rarely enabled to indulge in.

The excellence of the climate and the looseness of the soil render this place extremely proper for all kinds of vegetation, for if the ground be anywhere accidentally turned up it was immediately overgrown with turnips and Sicilian radishes.

This may in general suffice as to the soil and vegetable productions of this place, but the face of the country, at least the north part of the island, is so extremely singular that I can not avoid giving it a particular consideration. I have already taken notice of the wild, inhospitable air with which it first appeared to us and the gradual improvement of this uncouth landscape as we drew nearer, till we were at last captivated by the numerous beauties we discovered on the shore. And I must now add that the inland parts of the island did in no way fall short of the sanguine prepossessions which we first entertained in their favor, for the woods which covered most of the steepest hills were free from all bushes and underwood, and afforded an easy passage through every part of them: and the irregularities of the hills and precipices in the northern part of the island neces-

sarily traced out by their various combinations a great number of romantic valleys, most of which had a stream of the clearest water running through them that tumbled in cascades at the bottom of the valley by the course of the neighboring hills, was at any time broken into a sharp, sudden descent. Some particular spots occurred in those valleys where the shaded fragrance of the contiguous woods, the loftiness of the overhanging trees, and the transparency and frequent falls of the neighboring streams presented scenes of such elegance and dignity as would be with difficulty rivaled by any other part of the globe. It is in this place, perhaps, that the simple productions of unassisted nature may be said to excel all the fictitious descriptions of the most animated imagination.

ANIMALS OF JUAN FERNANDEZ.—It remains now only that we speak of the animals and the provisions which we met with at this place. Former writers have related that this island abounded with vast numbers of goats, and their accounts are not to be questioned, this place being the usual haunt of the buccaneers and privateers who formerly frequented these seas. And there are two instances, one of a Mosquito Indian and the other of Alexander Selkirk, a Scotchman, who were left here by their respective ships and lived alone upon this island for some years, and consequently were no strangers to its produce. Selkirk, who was the last, after a stay of between four and five years, was taken off the place (in 1708) by the *Duke* and *Dutchess*, privateers of Bristol, as may be seen at large in the journal of their voyage. His manner of life during his solitude was in most particulars very remarkable, but there is one circumstance which he relates which was so strangely verified by our own observations that I can not help reciting it. He tells us, among other things, that he often caught more goats than he wanted. He sometimes marked their ears and let them go. This was about thirty-two years before our arrival on this island. Now, it happened that the first goat killed by our people at their landing had its ears slit, whence we concluded that he had doubtless been formerly under the power of Selkirk. This was indeed an animal of most venerable aspect, dignified with an exceedingly majestic beard, and with many other symptoms of antiquity. During our stay on the islands we met with others marked in the same manner, all the males being distinguished by an exuberance of beard and every other characteristic of extreme age.

But the great number of goats which former writers describe to have been found upon this island are at present very much diminished, as the Spaniards, being informed of the advantages which the buccaneers and privateers drew from the provisions which goats' flesh here furnished them with, have endeavored to extirpate the breed, thereby to deprive their enemies of this relief. For this purpose they have put on shore great numbers of large dogs, who have increased apace and have destroyed all the goats in the accessible part of the country, so that there now remain only a few among the crags and precipices, where the dogs can not follow them. These are divided into separate herds of twenty or thirty each, which inhabit distinct fastnesses and never mingle with each other. By this means we found it extremely difficult to kill them; and yet we were so desirous of their flesh, which we all agreed much resembled venison, that we got knowledge, I believe, of all their herds, and it was conceived, by comparing their number together, that they scarcely exceeded two hundred upon the whole island. * * * These dogs, who are masters of all the accessible parts of the island, are of various kinds, some of them very large, and are multiplied to a prodigious degree. They sometimes came down to our habitations at night and stole our provisions, and once or twice they set upon single persons, but assistance being at hand they were driven off without doing any mischief. As at present it is rare for goats to fall in their way, we conceived that they lived principally upon young seals; and, instead, some of our people had the curiosity to kill dogs sometimes and dress them, and it seemed to be agreed upon that they had a fishy taste.

SEALS AT JUAN FERNANDEZ.—Goats' flesh, as I have mentioned, being scarce, we rarely being able to kill above one a day, and our people growing tired of fish (which, as I shall hereafter observe, abound at this place), they at last condescended to eat seals, which by degrees they came to relish and called it lamb. The seal, numbers of which haunt this island, hath been so often mentioned by former writers that it is unnecessary to say anything particular about it in this place. But there is another amphibious creature to be met with here, called a sea lion, that bears some resemblance to a seal, though it is much larger. This, too, we eat, under the denomination of beef, and as it is so extraordinary an animal I conceive it well merits a particular description. [This is the Southern Sea elephant, *Macrorhinus leoninus*, not the sea lion, *Otaria jubata*.—H. W. E.] They are in size, when arrived at their full growth, from 12 to 20 feet in length and from 8 to 15 feet in circumference. They are extremely fat, so that after having cut through the skin,

which is about an inch in thickness, there is at least a foot of fat before you can come at either lean or bones, and we experienced more than once that the fat of some of the largest afforded us a butt of oil. They are likewise very full of blood, for if they are deeply wounded in a dozen places there will instantly gush out as many fountains of blood, spouting to a considerable distance; and to try what quantity of blood they contained we shot one first and then cut its throat, and, measuring the blood that came from him, we found that besides what remained in the vessels, which, to be sure, was considerable, we got at least 2 hogsheads(!). Their skins are covered with a short hair, of a light dun color, but their tails and their fins, which serve them for feet on shore, are almost black. Their fins or feet are divided at the ends like fingers, and the web which joins them not reaching to the extremities, each of these fingers is furnished with a nail. They have a distant resemblance to an overgrown seal, though in some particulars there is a manifest difference between them, especially in the males. These have a large trunk or snout hanging down 5 or 6 inches below the end of the upper jaw, which the females have not, and this renders the countenance of the male and the female easy to be distinguished from each other; besides, the males are of a much larger size. The form and the appearance of both the male and the female are very exactly represented in the nineteenth plate, only the disproportion of their size is not usually so great as is there exhibited, for the male is drawn from life after the largest of these animals which was found upon the island. He was the master of the flock, and from his driving off the other males and keeping a great number of females to himself, he was by the seamen ludicrously styled the bashaw. These animals divide their time equally between the land and sea. continuing at sea all the summer and coming on shore at the setting in of winter, where they reside during that whole season. In this interval they engender and bring forth their young, and have generally two at a birth, which they suckle with their milk, they being at first about the size of a full-grown seal. During the time these sea lions continue on shore they feed upon the grass and verdure which grows near the banks of the fresh-water streams, and when not employed in feeding sleep in herds in the most miry places they can find. As they seem to be of a very lethargic disposition and are not easily awakened, each herd was observed to place some of their males at a distance, in the nature of sentinels, who never failed to alarm them whenever anyone attempted to molest or even to approach them, and they were very capable of alarming, even at a considerable distance, for the noise they make is very loud and of different kinds, sometimes grunting like hogs and at other times snorting like horses in full vigor. They often, especially the males, have furious battles with each other, principally about their females, and we were one day extremely surprised at the sight of two animals which at first appeared different from any of all we had observed, but on a nearer approach they proved to be two sea lions who had been goring each other with their teeth and were covered over with blood, and the bashaw, above mentioned, who generally lay surrounded with a seraglio of females, which no other male dared to approach, had not acquired that envied preeminence without many bloody contests, of which the marks still remained in the numerous scars which were visible in every part of his body. We killed many of them for food, especially for their hearts and tongues, which we esteemed good eating, and preferable even to those of bullocks. In general shape there was no difficulty in killing them, for they were incapable either of escaping or of resisting, as their motion is the most unwieldy that can be conceived, their blubber all the time they are moving being agitated in huge waves under their skins. However, a sailor one day being carelessly employed in skinning a young sea lion, the female from whence he had taken it came upon him unperceived, and, getting his head in her mouth, she with her teeth scored his skull in notches in many places, and thereby wounded him so desperately that, though all possible care was taken of him, he died in a few days.

FEW BIRDS.—These are the principal animals which we found upon the island, for we saw but few birds, and those chiefly hawks, blackbirds, owls, and humming birds. We saw not the pendella, which burrows in the ground, and which former writers have mentioned to be found here; but as we often met with their holes we supposed that the dogs had destroyed them, as they have almost done the cats; for these were very numerous in Selkirk's time, but we saw not above one or two during our whole stay. However, the rats still keep their ground, and continue here in great numbers, and were very troublesome to us by infesting our tents nightly.

ABUNDANCE OF FISH.—But that which furnished us with the most delicious repasts at this island remains still to be described. This was the fish, with which the whole bay was most plentifully stored, and with the greatest variety, for we found here cod of a prodigious size, and by the report of some of our crew, who

had been formerly employed in the Newfoundland fishery, not in less plenty than is to be met with on the banks of that island. We caught also cavallies, gropers, large breams, maids, silver fish, congers of a peculiar kind; above all, a black fish, which we most esteemed, called by some, a chimney sweeper, in shape resembling a carp. The beach, indeed, is everywhere so full of rocks and loose stones that there is no possibility of hauling the seine; but with hooks and lines we caught what numbers we pleased, so that a boat with two or three lines would return loaded with fish in about two or three hours' time. The only interruption we ever met with arose from the great quantities of dogfish and large sharks which sometimes attended our boats and prevented our sport. Beside the fish we have already mentioned, we found here one delicacy in greater perfection, both as to size and flavor and quantity, than is, perhaps, to be met with in any other part of the world; this was sea crayfish; they generally weighed 8 or 9 pounds apiece, were of a most excellent taste, and lay in such abundance near the water's edge that the boat hooks often struck into them in putting the boat to and from the shore.

STRANGE CONTRAST IN SEALING GROUNDS.—Thus ends Chaplain Walter's description of the plants, and the animals, and the fish of Juan Fernandez; and I quote him in full, because I wish to emphasize the decided difference in the temperament and constitution of the northern, or Alaskan, fur seal from that of its southern relative, which seems to have repaired to Juan Fernandez and Masafuera in countless thousands, "millions," Dampier said, in 1683, to breed in a tropical climate, on an island infested by bands of wild dogs and the waters surrounding alive with "large sharks!" Then, too, that the good prelate should have found fish so abundant where such multitudes of seals were aggregated seems strange; and it also occurs rather odd to me that he should have rested content with Dampier's brief description of the fur seal here, and passed the matter by, in the abrupt reference which he makes, declaring it superfluous to add more than "other writers" have spoken of.

THE ROOKERY OF MASAFUERA: A DESCRIPTION OF THE ISLET.—The island of Masafuera lies off the coast of Chile in south latitude 33° 45′, west longitude 80° 46′, just west of Juan Fernandez 93 miles. The surprising number of over 480,000 fur-seal skins are said to have been taken from it in a single season, some fifty years or so ago. Whether this immense aggregate was slain there or not it is certain that no one rookery in all the South Seas was of more importance. It is a high and mountainous volcanic islet, triangularly formed, and about 7 or 8 leagues in coast circuit. The general character of the island seems to be very much as I have indicated as characteristic of St. George, only that a luxuriant growth of exotic shrubbery is found thereon. On the north side of the island is a low point of land upon which the noted fur-seal rookery used to exist. "The seals," Carteret, in 1767, says, "were so numerous that I verily think if many thousands of them were killed in a night they would not be missed in the morning. We were obliged to kill a noted number of them, as when we walked the shore they were continually running against us, making at the same time a most terrible noise. These animals yield excellent train oil, and their hearts and plucks were very good eating, being in taste something like those of a hog, and their skins were covered with the finest fur I ever saw of the kind."

ANSON'S VISIT TO MASAFUERA.—Lord Anson sent one of his vessels over to Masafuera, for the purpose of surveying it thoroughly, while he was lying at Juan Fernandez refitting, June to September, 1740. Captain Saunders submitted substantially the following report, which Chaplain Walter indorses as valuable, inasmuch "as upon this occasion the island of Masafuera was more particularly examined than, I

dare say, it ever had been before, or, perhaps, ever will be again." He gives, in the succeeding language, the sum of the Anson survey:

The Spaniards have generally mentioned two islands under the name of Juan Fernandez, styling them the greater and the less, the greater being that island where we anchored, and the less being the island we are now describing, which, because it is more distant from the continent, they have distinguished by the name of Masa-Fuera. The *Tryal* sloop found that it bore from the greater Juan Fernandez west by south, and was about 22 leagues distant. It is a much larger and better spot than has been generally reported, for former writers have represented it as a small barren rock, destitute of wood and water and altogether inaccessible, whereas our people found it was covered with trees, and that there were several fine falls of water pouring down its sides into the sea; they found, too, that there was a place where a ship might come to anchor on the north side of it, though indeed the anchorage is inconvenient, for the bank extends but a little way, is steep, too, and has very deep water upon it, so that you must come to an anchor very near the shore, and there lie exposed to all the winds but a southerly one; and beside the inconvenience of the anchorage, there is also a reef of rocks running off from the eastern point of the island about 2 miles in length, though there is little danger to be feared from them, because they are always to be seen by the seas breaking over them. This place has at present one advantage beyond the island of Juan Fernandez, for it abounds with goats, who, not being accustomed to be disturbed, were nowise shy or apprehensive till they had been frequently fired at. These animals reside here in great tranquillity, the Spaniards not having thought the island considerable enough to be frequented by their enemies, and have not therefore been solicitous to destroy the provisions upon it, so that no dogs have been hitherto set on shore there. Beside the goats, our people found there vast numbers of seals and sea lions. And upon the whole they seemed to imagine that, though it was not the most eligible place for a ship to refresh at, yet in case of necessity it might afford some sort of shelter and prove of considerable use, especially to a single ship, etc.

NEGLECT OF CHILE.—Chile has suffered these famous breeding grounds of *Arctocephalus* to be ravaged and utterly eliminated. Here she had perpetual interests, worth many hundreds of thousands of dollars to her annually in the way of revenue, had they only been looked after and shielded from that wanton and mercenary destruction which has been visited upon them by sealers of all nations between 1806–1840. In 1717 the Spanish Government revived and reestablished the colony of Juan Fernandez on that island, but it was in the lapse of a few decades almost entirely ruined by an earthquake. During 1810 the Chileans gained their independence, and these two islands formed part of their possessions. In 1819 they established a sort of a Botany Bay on Juan Fernandez and have had as many as 500 prisoners there at a time. It was found, however, to be too expensive, and when a mutiny in 1835 placed the island in the hands of the convicts for a brief period, then the prisoners were all removed shortly afterwards and the island deserted, and remained so for forty-five or fifty years. At the present time the two islands, Fernandez and Masafuera, are leased by a Chilean merchant, who employs all the settlers in cutting wood, tending cattle, and, during the season, in sealing. The average catch is about 2,000 fur seals annually.

VALUE OF THE ANSONIAN ACCOUNT JUST QUOTED.—The Ansonian description, thus quoted in much detail, is one that can not fail to cause decided comment upon the marked physical differences under which the fur seal thrives in the north on the islets of Bering Sea, as *Callorhinus ursinus*, or in the south, as *Arctocephalus australis*, on Masafuera and Juan Fernandez. According to Walter, the size of these two subtropical islands is nearly in accord with the area which I found belonging to the Pribilof group, St. Paul being about the same superficial area of Juan Fernandez, with outlying rocks and islets

alike peculiar to each, while St. George is a trifle larger only than the smaller Masafuera, with water bold and abrupt all around about them.

THE SUBTROPICAL ROOKERIES MERE ROCKY BREEDING BELTS.—The rookery sites of the fur seal are not located by any writer on either island. I should judge from Walter's account that the entire desolate south shore of Juan Fernandez was a belt of cliff-bound breeding grounds, where these animals laid, as they do to-day, under the bluffs on the Great Eastern rookery at St. George, and to which spot none of the Dampier or Anson voyagers resorted. Indeed, from all that I can learn of the physical structure of the islands to which the southern fur seal repaired, the whole area presented suitable for these creatures to breed upon was of this character, save that of the Falkland Islands, no such ground in general topography as St. Paul being known to the Antarctic, nor is it found elsewhere in the Arctic; but St. George is the common type of the southern seal islands, as it is also typical of the entire Aleutian chain and Alaska generally.

STRANGE OMISSION OF CHAPLAIN WALTER.—The one queer thought in my mind relative to this lengthy visit of Anson to Juan Fernandez is that the historian, from whom I have quoted so liberally, should not speak of the fur seal, for, thirty-two years prior to his landing, Captain Wood-Rogers, of the *Duke*, a privateer, touched here to recruit, and found "Robinson Crusoe" Selkirk in lonely possession. That sailor left with Rogers, February 12, 1709, and he gave quite a story of his discovery of the seals, which is related by the captain. Curiously enough, according to Selkirk, the time when the fur seal hauls out to breed on Juan Fernandez is that season of the year when Anson was there. Wood-Rogers reports him as saying, "Toward the end of the month of June these animals come on shore to bring forth their young, and remain to the end of September without stirring from the spot and without taking any kind of nourishment." (Kerr: Collection of Voyages, Vol. XI.)

NUMBERS OF DEADLY ENEMIES THERE: SHARKS.—The time of breeding, therefore, is about the same as in Bering Sea. Also, in this connection, Commodore Byron, who came, in his voyage round the world, to Masafuera in 1765, seeking wood and water, says:

> Sunday, April 28, 1765. * * * There was, however, another species of danger here to which our cork (surf) jackets afforded us no defense, for the sea abounded with sharks of an enormous size, which, when they saw a man in the water, would dart into the very surf to seize him. Our people, however, happily escaped them, though they were many times very near. One of them, which was upward of 20 feet long, came close to one of the boats that was watering, and having seized a large seal instantly devoured it at a mouthful, and I myself saw another of about the same size do the same thing under the ship's stern. (Hawksworth: Voyages, London, 1773, Vol. I, pp. 87–88.)

No other mention of seals is made by him here at Masafuera.

THE VOYAGE OF DAMPIER.—Fifty-seven years prior to Chaplain Walter's inspection and description of Juan Fernandez Capt. William Dampier stopped here, also, to wood and to water and to rally his crew from scurvy. He was making a "new voyage 'round the world," sailing from England. He passed two weeks there in these exercises of recuperation and refitting. The justly celebrated buccaneer delivers himself in this terse strain:

> These [seals] at *John Fernandos* have fine thick short Furre; the like I have not taken notice of any where but in these Seas. Here are always thousands, I might possibly say millions of them, either sitting on the Bays, or going and coming in the sea round the Island, which is full of them (as they lie at the top of the Water

playing and sunning themselves) for a mile or two from the shore. When they come out from the Sea they bleat like Sheep for their young; and though they pass through hundreds of other's young ones before they come to their own, yet they will not suffer any of them to suck. The young ones are like Puppies and lie much ashore, but when beaten by any of us, they as well as the old ones will make toward the Sea, and swim very swift and nimble; though on shore they lie very sluggishly, and will not go out of our way unless we beat them, but snap at us. A blow on the Nose soon kills them. Large Ships might here load themselves with Seal Skins and Trane oyl; for they are extraordinary fat. (Dampier: A New Voyage Round the World, 1683; fifth edition, revised, 1703; vol. I, pp. 88, 90.)

DAMPIER, NOT COOK, FIRST TO NOTE THE FUR SEAL.—This account of Dampier will be instantly recognized, as far as he speaks of their habits, as an exact portrait of a breeding rookery of the fur seal. It is painfully brief, however; but it antedates Steller's contribution to the life and habits of the *Callorhinus* some sixty years, and is a hundred years nearly in advance of Captain Cook's mention of the same subject on the South Georgian (1771) and the Falkland islands (1774). He, therefore, and not Cook, deserves the credit of being the first man to call the attention of the civilized world to the value and the numbers of the fur seal as it existed in southern waters, while Steller enjoys the same reputation with respect to those of the north.[1]

But after searching through scores of antique traveler's volumes and reading the musty records through and through—after extended personal intercourse with several of the very men who were active in fur sealing throughout the Antarctic forty years ago—I have nothing but a mass of disjointed and conflicting data to show as to the real number of fur seals slain in the waters south of the equator; while the record made by these men of the life and habit of *Arctocephalus australis* is that odd medley of fact and fiction which destroys the value of the one and the romance of the other.

THE FALKLAND ISLANDS: THEIR DISCOVERY.—Capt. John Davies, an Englishman, and a companion of Sir Thomas Cavendish, who made a privateersman's voyage to the South seas in 1592, was the first person who saw the Falkland Islands. In 1594 Sir Richard Hawkins landed upon them and called them in honor of his queen and himself,

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[1] William Dampier was the boldest and clearest headed navigator of all who then sailed into unknown seas. He discovered Australia a century before Cook saw it, cruising at that time as a buccaneer; his narrative gave Defoe the idea and supplied the incidents of Robinson Crusoe, on Juan Fernandez; and there is no question in my mind that he possessed those qualities which distinguished Captain Cook to the fullest extent. He only lacked the power of the Government behind him to have made a much earlier record, and entirely as meritorious as is the one which Cook left for posterity.

Although Dampier gives the first sensible and positive description of the fur seal that I can find, yet there is one reference to this animal much earlier; but it requires the reading of an expert to notice that it arose from the sight of a fur seal. It is found in the account of Henry Braüer, or Brewer, who, in behalf of the Dutch West India Company, landed on the coast of Staten Land, March 9, 1642, en route to Chile. Here, at Valentines Bay, he "saw among the rocks several sea lions and sea dogs, about the bigness of a good European calf; some of a grayish, some of a brownish color, making a noise not unlike our sheep, and at the approach of our men they betook themselves to the sea." (Churchill: Voyages: London, 1700; vol. I, p. 456.) As the fur seal is the only one of its family that makes a "noise not unlike our sheep," there is no question that Henry Brewer saw a number of female *Arctocephalus australis*, in especial; though males were along, they being so much larger, he deemed different, and termed them seal ions.

Juan Fernandez, the Spanish navigator and adventurer, who, in 1563–1567, discovered, preempted, and colonized the island of his name, died there in 1575 or thereabouts; with his decease the settlement was abandoned. He probably was the first of all civilized men to really know what a fur seal was, but he has left no record, to my knowledge, of the fact.

"Hawkins' Maiden-land;" he said nothing about seals. In 1598 they they were seen by a Dutch squadron, Verhagen, and Sebald de Wert commanding; they touched and, ignorant of prior discovery, named them "Sebald's Islands." Capt. William Dampier, an Englishman, nearly one hundred years after, in 1686, visited them and styled them "Sibbet de Wards;" he does not speak of seals there. They were finally called the Falkland Islands by Strong, an English navigator, in 1689; the manuscript journal of Strong yet remains unpublished and filed away in the archives of the British Museum. Captain Cook's emphatic mention of the fur seal at South Georgia in 1771 gradually drew the attention of fur sealers to a focus, when, from 1801 to 1840, inclusive, the whole Antarctic sealing ground was ravaged by them, and the Falkland Islands were the head center of all their operations. Great Britain took immediate jurisdiction, for the first time, over the Falkland Islands in 1833.

EXTRAORDINARY ABSENCE OF SEALING DATA.—Such, in brief, are the circumstances that attended the early discovery of these celebrated Falkland Islands, which were the rendezvous of a large sealing fleet for a period of nearly thirty years—from 1800 to 1826, inclusive; yet, in spite of it, I can find little or no evidence of the extent of the catch thereon, or of the general location of the vast rookeries known to be slaughtered here during that extended interval. If these islands had been far beyond the track of commerce, as are all the other Antarctic sealing grounds save Juan Fernandez, then the remarkable, surprising want of data in this respect would not be so marked a feature to the history of the subject. The Falkland Islands have not only been a common port of entry and departure for vessels of all nations since their discovery in 1594, but as far back as 1770 they were a bone of contention and long-sustained diplomatic overtures between Spain and Great Britain, which came very near to plunging both countries into war on their sole account. I will recite the history of this disturbance, because its solution was the direct result of our losing possession of Vancouvers Island and all that British Columbian territory to-day south of 54° 40′ north latitude—a fur-sealing quarrel at the outset originated the whole difficulty.

TROUBLES HERE WHICH CAUSED US THE LOSS OF VANCOUVER'S ISLAND.—The piratical cruise of Sir Francis Drake in 1577, followed by that of Thomas Candish, or Cavendish, and John Davies, in 1592, whereby the Spanish settlements and galleons on the west coasts of the American continent were literally ravished, aroused the Castilians to a sense of their future danger, and they began rather slowly to provide means of shelter and future support. In prosecution of this plan for protecting the Spanish settlements and commerce of America, Francisco Bucareli, the governor of Buenos Ayres, on the 10th of June, 1770, forcibly expelled the handful of British "sealers" from their little establishment, Port Egmont, on the Falkland Islands. As soon as the news of this expulsion reached London, the English secretary of state, Lord Weymouth, addressed, September 12, a demand to the court at Madrid for the immediate disavowal, on its part, of the acts of Bucareli, and called for the prompt and unconditional restitution of the islands in the condition which they were before the writs of removal were executed. War was imminent, but Louis XV, of France, tendered his good offices as a mediator between the two disputants. The Spanish Government acceded to this and placed the entire settlement of the controversy in the hands of the King of France, for his disposition as he should consider proper for the honor

and rights of Spain. On the 22d of January, 1771, the offers of the King of France were accepted by the Court of St. James. On this day the Spanish ambassador at London, Prince Masserano, presented to Lord Rochford a declaration in the name of the King of Spain, saying that His Catholic Majesty, solely desirous of maintaining peace with England, disavowed the acts of violence committed by the governor of Buenos Ayres, and engaged to restore to His Britannic Majesty and his subjects "the port and fort at Egmont, in the Falkland Islands, with all the artillery, stores, and effects, precisely" as they were before the 10th of June, 1770. At the same time, however, this offer of restitution contained the following significant clause: "This contract can not, nor will it in any way, affect the question of prior right of sovereignty to the Falkland Islands."

THE TREATY OF NOOTKA INFLUENCED HERE.—The expelled Falkland Islanders were then replaced at Port Egmont, but in 1774 they were abruptly withdrawn by order of their own Government, and these islands were again taken possession of by the Spaniards, who retained their hold until South America became independent. This abandonment of Great Britain provoked the bitterest political debates in Parliament, and feeling ran high all over that country. Deeply imbued with this sentiment, Vancouver went out, in 1791, specially charged by the English Government to take possession of the British territory on the northwest coast, according to the articles of the treaty of 1790 between Spain and England, and came to that region in the following year. The Spaniards claimed Vancouver's Island then in their own right, and in behalf of the Americans, Captains Gray and Kendrick; their agent, Señor Juan Francisco de la Bodega y Quadra, was stationed at Nootka Sound; and immediately after Vancouver's arrival, August 12, 1792, the negotiations were commenced, but Quadra could do nothing in behalf of their rights and those of American discovery. Vancouver peremptorily refused to entertain the subject. Quadra therefore surrendered "Quadra and Vancouver's Island" to him, under protest, and withdrew every sign of Spanish authority from these waters of the North Pacific.

Thus the disturbances which arose over the abandonment of the Falkland Islands in 1774 worked the loss of that northwest territory to us, through Spain, in 1792. My only regret (after an extended personal residence on Vancouver Island) concerning this whole subject is that, out of all the uproar at the Falklands, nothing definite has been placed on record relative to the numbers and disposition of the fur seal thereon.

CATALOGUE OF THE MAMMALS OF THE PRIBILOF GROUP.

[Memoranda of collections made by Henry W. Elliott, Pribilof Islands, 1872 to 1876, inclusive.]

CANIDÆ.

Vulpes lagopus. BLUE OR ARCTIC FOX. Common.

Blue foxes were also, and are, natives of the Commander Islands. Steller describes their fearlessness when the shipwrecked crew of the *St. Peter* landed there, November 6, 1741. I saw them also at St. Matthew Island.

In regard to these foxes the Pribilof natives declare that when the islands were first occupied by their ancestors, 1786–87, the fur was invariably blue; that the present smoky blue, or ashy indigo color, is due to the coming of white foxes across on the ice from the mainland to the eastward. The white-furred vulpes is quite numerous on the

islands to-day. I should judge that perhaps one-fifth of the whole number were of this color. They do not live apart from the blue ones, but evidently breed "in and in." I notice that Veniaminov also makes substantially the same statement, only differing by charging this deterioration of the blue foxes' fur to the deportation from outside of red ones, on ice floes, and adds that the natives always hunted down these "krassnie peeschee" as soon as their presence was known; hence my inability, perhaps, to see any sign of their posterity in 1872–1876.

The presence of these animals on the Pribilof Islands is a real source of happiness to the natives, especially so to the younger ones. The little pup foxes make pets and playfellows for the children, while hunting the adults during the winter gives wholesome employment to the mind and body of the native who does so. They are trapped in common dead falls, steel-spring clips, or beaver traps, and shot. A very large portion of the gossip on the island is in relation to this business.

PINNIPEDIA.

Callorhinus ursinus. FUR SEAL. Abundant.
Eumetopias Stelleri. SEA LION. Common.
Phoca vitulina. HAIR SEAL. A few only.

While the *Phocidæ* are so scant as to number and variety in the waters of the North Pacific and Bering Sea, yet they fairly rival the myriads of the fur seal here by their presence in the waters of the North Atlantic, and also their surprising aggregate in the Caspian Sea. So great is the volume of hair-seal life in the circumboreal region of the Orient that the astonishing sum of from 850,000 to 900,000 *Phocidæ* are annually taken there, and from the Caspian Sea an additional count of a yearly average of 130,000, making a round million of these animals slaughtered every season. At least such are the data which we find in the writings of the only credible authorities known, viz: Bonnycastle, Newfoundland, in 1842, vol. 1, p. 159; Carroll, Seal and Herring Fisheries of Newfoundland, 1873, p. 9; Lindeman, Pet. Geogr. Mitth., pp. vi, 118; Die Arktische Fischerei der Deutschen Seestädte, 1620–1868; Brown, Man. Nat. Hist. Geol., etc., of Greenland, 1868–1875; Melsom, Pet. Geogr. Mitth., 1869, p. 81; Petersen, Pet. Geogr. Mitth., 1870, pp. 194 et seq., 1871, pp. 35 et seq.; Lovenskiöld, Land and Water (newspaper), 1875, p. 160; Schultz, Rep. U. S. Com. Fish and Fisheries, pt. iii, for 1873–74 and 1874–75 (a translation of the original published at St. Petersburg in 1873). Allen, in his History N. A. Pinnipeds, has so liberally compiled and quoted from these authors that it would be simply superfluous service to reprint those records here.

Odobænus obesus. WALRUS. A few only.

CETACEA.

Orca gladiator, var. rectipennis. KILLER WHALES. A few only.
Megaptera versabilis. HUMPBACK WHALES. A few only.

RODENTIA.

Myodes obensis. LEMMING. Abundant on St. George only.
Mus musculus. HOUSE MOUSE. Common in the villages (imported by man).

CATALOGUE OF THE BIRDS OF THE PRIBILOF GROUP.

VAST NUMBERS OF WATERFOWL.—In the seasons of 1872–73, respectively, throughout the ornithological breeding terms on St. Paul

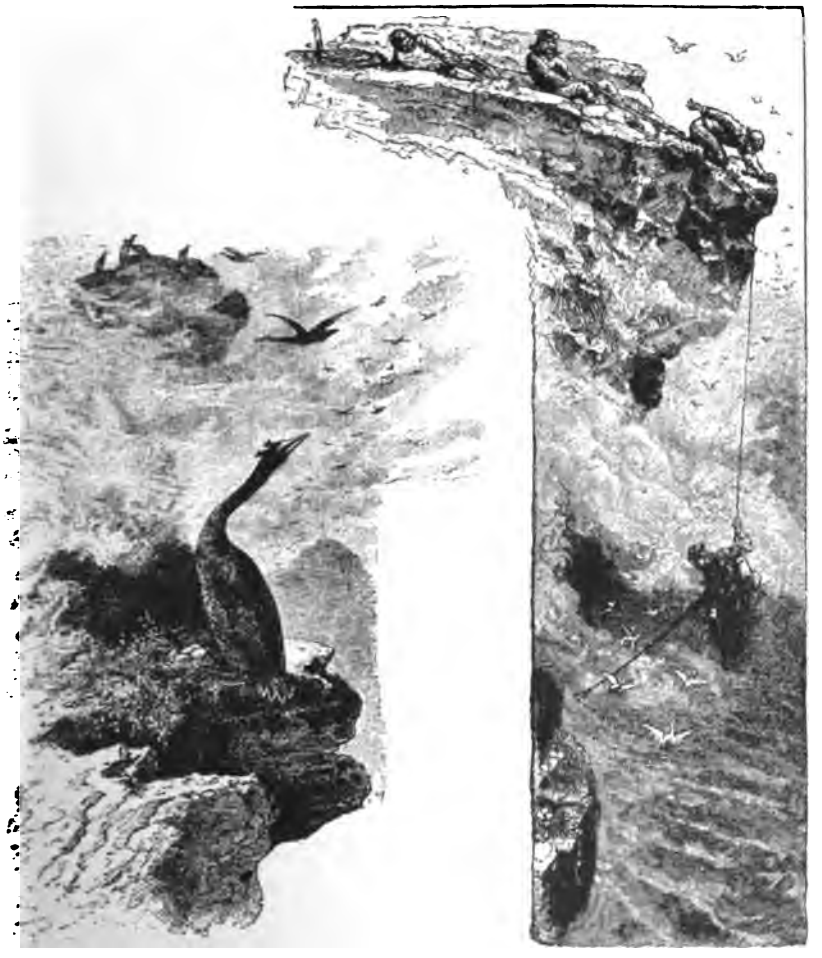
and St. George, I neglected no opportunities, as they occurred, to secure everything that was peculiar to the feathered life upon these islands. The dreary expanse and lonely solitudes of the North owe their chief enlivenment, and their principal attractiveness for man, to the presence of the vast flocks of circumboreal waterfowl, which repair thither annually. It is true that the mammalian life of the Pribilof group renders its immense aggregate of avifauna insignificant by comparison, but to the naturalist and many who are not technically versed the following check list of those species which I found there, together with a brief biography accompanying each title, may be of more than passing interest.

While a few species of waterfowl come to these islands in myriads for the purpose of breeding, it will be noticed that the list of names met with here is a brief one; still it is of much value to the naturalist, inasmuch as it comprises so many desiderata scarcely to be obtained elsewhere.

THE IMMENSE ROOKERIES OF ST. GEORGE.—Over 15 miles of the bold, basaltic, bluff line of St. George Island is fairly covered with nesting gulls, *Rissa*, and "arries," *Uria*, while down in the countless chinks and holes over the entire surface of the north side of this island millions of "choochkies," *Simorhyncus pusillus*, breed, filling the air and darkening the light of day with their cries and fluttering forms. On Walrus Islet the nests of the great white gull of the north, *Larus glaucus*, can be visited and inspected, as well as those of the sea parrot or puffin, *Fratercula*, sp., shags or cormorants, *Graculus*, sp., and the red-legged kittiwake, *Larus brevirostris*. These birds are accessible on every side, can be reached, and afford the observer an unequaled opportunity of taking due notice of them through their breeding season, as it begins in May and continues until the end of September.

ECONOMIC VALUE TO INHABITANTS.—Not one of the water birds found on and around the islands is exempted from a place in the native's larder; even the delectable "oreelie" are unhesitatingly eaten by the people, and indeed these birds furnish, during the winter season in especial, an almost certain source of supply for fresh meat. But the heart of the Aleut swells to its greatest gastronomic happiness when he can repair, in the months of June and July, to the basaltic cliffs of St. George, or the lava table bed of Walrus Islet, and put his grimy hands on the gaily colored eggs of the "arrie," *Lomvia arra;* and if he were not the most improvident of men, instead of taking only enough for the day he would lay up a great store for the morrow, but he never does. On the occasion of one visit, and my first one there, July 5, 1872, six men loaded a badarrah at Walrus Islet, capable of carrying 4 tons, exclusive of our crew, down to the water's edge with eggs in less than three working hours.

DISAPPEARANCE OF BIRDS IN WINTER.—During the winter months the birds are almost wholly absent, especially if the ice shall have closed in around about the islands. Then there is nothing of the feathered kind save the stupid shag, *Graculus bicristatus*, as it clings to the leeward cliffs, or the great burgomaster gull, which sweeps in circling flight high overhead; but early in May they begin to make their appearance, and they come up from the sea overnight, as it were. Their chattering and their harsh caroling wakes the natives from their slothful sleeping, which, however, they gladly break, to seize their nets and live life anew, as far as eating is concerned. The stress of severe weather in the winter months, the driving of the snow



THE CURIOUS SHAG. NATIVES OVER THE CLIFFS.

OÖLOGICAL SKETCHES ON ST. GEORGE, BY THE AUTHOR.

Herewith presented through the courtesy of Harper Brothers.

"boorgas," and the floating ice floes closing in to shut out the open water, are cause enough for the disappearance of the waterfowl during the hyemal season.[1]

CASTAWAY BIRDS ON THE PRIBILOF ISLANDS.—The position of the islands is such as to be somewhat outside of the migratory path pursued by the birds on the mainland; and, owing to this reason, they are only visited by a few stragglers from that quarter, a few from the Asiatic side, and by the millions of their own home-bred and indigenous stock. One of these migratory species, *Strepsilas interpres*, however, comes here every summer for three or four weeks' stay in great numbers, and actually get so fat in feeding upon the larvæ which abound in the decaying carcasses over the killing grounds that it usually bursts open when it falls, shot on the wing. A heavy easterly gale often brings a strange bird to the islands from the mainland. A grebe, *Podiceps griseigena*, was stranded on St. George in 1873, whereupon the natives declared the like of which they had never seen before. When I found a robin one cool morning in October, the 15th, the natives told me that it was an accident, brought over by some storm or gale of wind that took it up and off from its path across the tundra of Bristol Bay. The next fair wind sweeping from the north or the west could be so improved by this robin, *Turdus migratorius*, that it would spread its wings and as abruptly return. Thus hawks, owls, and a number of foreign waterfowls visit the islands, but never remain there long.

FAILURE TO INTRODUCE RAVENS.—The Russians tried the experiment of bringing up from Sitka and Unalaska a number of ravens as scavengers a number of years ago, and when they were very uncleanly in the village, in contrast with the practice of the present hour. They reasoned that they would—these ill-omened birds—be invaluable as health officers; but the *Corvidæ* invariably, sooner or later, and within a very short time, took the first wind train back to the mainland or to the Aleutian Islands. Yet the natives say that if the birds had been young ones instead of old fellows they would have remained. I saw a great many, however, at St. Matthew Island in August, 1874; also, their slowly-marked flight overhead was a common sight on St. Lawrence.

POULTRY KEPT BY NATIVES.—The natives keep a small number of chickens, and often they take their poultry into their living rooms and

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[1] While daily served on St. George, during June and July, with eggs of indigenous sea fowl, I recorded my gastronomic comparisons which occurred then as I ate them. Here follows a recapitulation:

Fresh-laid eggs of "lupus," or *F. glacialis*.—Best eggs known to the islands; can be soft boiled or fried, and are as good as our own hens' eggs; the yolk is light and clear; the size thereof is in shape and bulk like a duck's egg; it has a white shell. Season, June 1 to 15, inclusive; scarce on St. Paul and not abundant on St. George.

Fresh-laid eggs of "arrie," or *L. arra*.—Very good; can be soft boiled or fried; are best scrambled; yolks are dark; no strange taste whatever to them; pyriform in shape; large as a goose egg; shell gaily colored; they are exceedingly abundant on Walrus Island and St. George; tons of them. Season, June 25 to July 10, inclusive.

Fresh-laid eggs of gulls, *Laridæ*.—Perceptibly strong; can not be relished unless in omelettes; yolks very dark; size and shape of our hen's egg; shell dark; clay-colored ground, mottled. Season, June 5 to July 20, inclusive; they are in moderate supply only.

The other eggs in the list, such as those of the "choochkie," the "shag," and the several varieties of waterfowl which breed here, are never secured in sufficient quantity to be of any consideration as articles of diet. It is, perhaps, better that the scarcity of their kind continue, judging from the strong smack of the choochkie's, the repulsive taint of the shag's, and the "twang" of the sea parrot's, all of which I tasted as a matter of investigation.

coop them up in the corners. They get return in eggs. But of all the forlorn, wretched, bedraggled specimens of domestic fowls, those that have to shiver and shake themselves outside when viewed on the seal islands are the most miserable. They do not exactly freeze, but the raw, damp, incessant violence of the weather keeps them inactive and cowering for such long, unbroken periods that their feathers seem to fall out, and disease marks them for its own.

OOLOGICAL WEALTH OF WALRUS ISLAND.—I am much divided in my admiration of the two great bird rookeries of the Pribilof group, the one on the face of the high bluffs at St. George and the other on the table top of Walrus Islet; but perhaps the latter place gives, within the smallest area, the greatest variety of nesting and breeding birds, for here the "arrie" and many gulls, cormorants, sea parrots, and auks come to lay their eggs in countless numbers. The foot and brow of the low, cliff-like sea fronts to this island are occupied almost exclusively by the "arries," *Lomvia arra*, which lay a single egg each on the surface on the bare rock and stand just like so many champagne bottles straddling over them while hatching, only leaving at irregular intervals to feed, and then not until their mates relieve them. Hundreds of thousands of these birds alone are thus engaged about the 29th of every June on this little rocky island, standing stacked up together as tight as so many sardines in a box—as thickly as they can be stowed—each of them uttering an incessant, deep, low, hoarse, grunting noise. How fiercely they quarrel among themselves—everlastingly; and in this way thousands of eggs are rolled off into the sea, or into crevices, or into fissures, where they are lost and broken.

TOUGHNESS OF ARRIE EGGSHELLS.—The "arrie" lays but one egg. If it is removed or broken she will soon lay another; but if undisturbed after depositing the first she undertakes its hatching at once. The size, shape, and coloration of this egg among the thousands which came under my observation are exceedingly variable. A large proportion of the eggs become so dirty by rolling here and there in the guano while the birds tread and fight over them as to be almost unrecognizable. I was struck by the happy adaptation of nature to their rough nesting. It is found in the toughness of the shell of the egg—so tough that the natives when gathering them throw them as farmers do apples into their tubs and baskets on the cliffs, and then carry them down to the general heap of collection near the boats' landing, where they pour them out upon the rocks with a single flip of the hand, just as a sack of potatoes would be emptied; and then again after this they are quite as carelessly handled when loaded into the "bidarrah," sustaining through it all a very trifling loss from crushed or broken ones.

BIRD ZONES ON WALRUS ISLET.—Those "arries" seem to occupy a ribbon in width, and draw around the outward edges of the flat table top to Walrus Island a regular belt, keeping all to themselves, while the small grassy interior from which they are thus excluded is the only place, I believe, in Bering Sea where the great white gull, *Larus glaucus*, breeds. Here I found among the little mossy tussocks the burgomaster building a nest of dry grass, sea ferns, *Sertularidæ*, etc., very nicely laid up and rounded, and in which it laid usually three eggs, sometimes only a couple. Occasionally I would look into a nest with four. These big birds could not breed on either of the other islands in this manner, for the glaucous gull is too large to settle on the narrow shelf ledges of the cliffs, as the smaller *Laridæ* and other

:RING EGGS ON WALRUS ISLAND.

THE "KANOOSKA."

OPATRA'S NEEDLE.
'. LAWRENCE ISLAND.)

NO ROOM FOR ARGUMENT.

LOGICAL SKETCHES ON THE SEAL-ISLANDS, BY THE AUTHOR.

Herewith presented through the courtesy of Harper Brothers.

waterfowls do, and those places which would receive it might also be a hunting ground and footing to the foxes.

The red-legged kittiwake, *Larus brevirostris*, and its cousin, *Larus tridactylus*, build in the most amicable manner together on the faces of the cliffs, for they are little gulls, and they associate with the cormorants, sea parrots, and auks, all together; and, with the exception of the latter, the nests are very easy of access. All birds, especially the "arries," have an exceedingly happy time of it on this Walrus Islet—nothing to disturb them, in my opinion—free from the ravenous maw of the foxes over at St. Paul and from the piratical and death-dealing sweep of owls and hawks which infest the Aleutian chain and the mainland.

SYSTEMATIC LIST OF THE AVIFAUNA.—I will now offer in natural sequence a list of the names which are to be seen every year upon the ornithological register of the Pribilof Islands, and the transient ones also:

1. **Turdus migratorius.** ROBIN; "RAP-O-LOOF."

Casual, and rarely seen; never resident. Specimen secured October, 1872.

2. **Anorthura troglodytes var. alascensis.** ALASKAN WINTER WREN; "LIMMER-SHIN."

This wee bird is not migratory, but remains permanently upon St. George. Its nest is built in small, deep holes and crevices of the cliffs. I have not myself seen it, but the natives say that it lays from eight to ten eggs in a nest made of dry grass and feathers, roofed-over, with an entrance at the side to the nest chamber, being thus elaborately constructed.

The male is exceedingly gay during the period of mating and incubation, flying incessantly from plant to plant or from rock to rock, and singing a rather loud song for a small bird. I shot the young, fully fledged, on the 28th of July. It differed only from the parent in having a much shorter bill and a darker and more diffuse coloration. Although St. Paul Island is but 27 miles to the northwest, as the crow flies, from St. George, not a single specimen of this little wren has been seen there. I made during the whole season of 1872 unavailing search for it.

The natives' name, "limmer-shin," signifies a chew of tobacco; and, as the bird is not as large as some quids which I have seen, the name is quite appropriate, for the dull brown and black plumage of the bird suggests it also.

3. **Leucosticte tephrocotis var. griseinucha.** GRAY-EARED FINCH; "PAHTOSHKIE."

This agreeable little bird, always cheerful and self-possessed, is a regular and permanent settler on the islands, which it never leaves. In the depth of dismal winter, as well as in the halo of a summer's day, the pahtoshkie greets you with the same pleasant chirrup, wearing the same neat dress, as if determined to make the best of everything. It is particularly abundant on St. George, where its habit may be studied to great advantage. The pahtoshkie nests in a chink or crevice of the cliffs, building a warm, snug home for its little ones, of dried grasses and moss, very neatly put together, and then lined with a few superfluous feathers. The eggs vary in number from three to six; generally four. They are pure white with a delicate rosy blush, when fresh, and measure 0.97 by 0.67 of an inch. The young break

the shell at the expiration of twenty or twenty-two days' incubation, the labor of which is not shared by the male. He, however, brings food to his mate, singing as most birds do of his kind, highly elated by the prospects of paternity. The chicks at first are sparsely covered with a sprinkling of dark-gray down, and in two or three weeks gain their feathers, fitting them for flight, though they do not acquire the ash and black of the head, while the chocolate-brown on the back is rich, and the rosy tints of their feather tips turn to crimson. These bright hues of adolescence do not appear until they are 1 year old. Between the old birds, however, there is no outward dissimilarity in size or coloration, the male and female being exactly alike. They feed upon various seeds and insects, as well as the larvæ which swarm on the killing grounds. They are fearless and confiding, fluttering in the most familiar manner around the village huts. In the summer of 1873 a pair built their nest and reared a brood under the eaves of the old Greek church, that tottered on its rotten foundations at St. George. It has no song, but utters a low mellow chirp, sounding this note both flying and sitting, in the same cadence. It seems to pair off altogether and never reassembles in flocks. I secured a large number of beautiful specimens of the adults of both sexes in neat breeding attire, and others illustrating the earliest plumage of the young.

4. Plectrophanes nivalis. SNOW BUNTING; "SNAGUISKIE."

The snowbird is another permanent resident of these islands, but one which, unlike the pahtoshkie, you will notice, is very shy and retiring, nesting high on the rocky, broken uplands, never coming down to the village, except during unusually severe or protracted cold weather. This bird builds an elegant and elaborate nest of soft, dry moss and grass, and lines it warmly again with a thick bed of feathers. It is placed on the ground, beneath some heavy lava shelf or at the foot of an enormous bowlder. Five eggs are usually laid, about the 1st of June. They are an inch long by two-thirds broad, of a grayish or greenish white, spotted sometimes all over, sometimes at or around the larger end only, with various shades of rich dark brown, purplish brown, and paler neutral tints. Sometimes the whole surface is quite closely clouded with diffuse reddish-brown markings. Upon the female the entire labor of the three weeks' incubation required for the hatching of her brood devolves. During this period the male is assiduous in bringing food, and at frequent intervals sings his simple but sweet song, rising, as he begins it, high up in the air, as the skylark does, and at the end of the strain drops suddenly to the ground again. The young are early provided with a gray, downy coating, which is speedily replaced by one resembling that of the adult female, and in less than four weeks from the date of hatching the little "snaguiskie" is as big as its parents and weighs more. The food of this species consists of the various seeds and insects peculiar to the rough higher grounds it frequents, being especially fond of the small coleopterous beetles found on the island. It never flies about the rocks here, and can not be called at any season of the year gregarious, like its immediate relative, the Lapland longspur, with which it is associated on these seagirt islets.

5. Plectrophanes lapponicus. LAPLAND LONGSPUR; "KARESCH-NAVIE SNAGUISKIE."

This bird is the vocalist par excellence of the Pribilof group, singing all through the month of June in the most exquisite manner, rising

high in the air and hovering on fluttering wings over its sitting mate. The song is so sweet that it is always too short, though it lasts a few moments, with brief intervals only. This songster is much more shy and reserved than the common snow bunting, and it rarely enters the village. It is most abundant on St. Paul Island, where, unlike the snow bunting, it seeks the low grassy grounds, both for food and nesting, being never found among the rough bowlders chosen for a home by the other *Plectrophanes*. The two nests which I found were built in tussocks or grass on the low hummocky flat between the village and the main ridge of St. George, sheltered and half concealed beneath a drapery of withered grass. In each case the mother bird did not fly away till I almost stepped upon her nest, when she quickly fluttered off and disappeared in perfect silence. Those nests and females in breeding dress were the first of their kind to arrive at the Smithsonian collection. One nest contained four and the other five eggs, rather smaller than the snow bunting, and of a rich gray-brown color, with deep shades of brown running over them in spots and suffused lines. These examples were not discovered until the 7th of July, at which date the eggs in both were perfectly fresh. They were probably not laid until about the end of June. The young appear in the same manner as those of *P. nivalis*. The males do not assume the distinctive coloration of their sex until the next season. The natives say that very severe weather sometimes drives the longspur away, although the other relative, the snow bunting, is never forced to leave.

6. Corvus corax. RAVEN; "VAR-RONE."

As I have remarked in my general introduction the experiment of introducing ravens was unsuccessfully tried by the Russians, but the natives still claim that if a number of young birds were brought here and raised they could be induced to remain upon the islands during the whole season. They say that the failure to keep those birds brought up from Unalaska on several occasions prior was due to the fact of their being old birds.

7. Falco sacer. GYRFALCON.

The specimen of this bird in my collection was evidently stranded and forced out of its usual flight when I secured it on the Reef Point at St. Paul Island, March, 1873. It was the only one that I saw while there.

8. Charadrius fulvus. GOLDEN PLOVER.

The appearance of this specimen in my collection was another new item added to the list of North American birds, since it is the first American specimen of the true Asiatic *fulvus*, and not the North American var. *Virginicus*. It came to St. Paul as a wanderer on the 2d of May, 1873, and the natives told me that it was a frequent visitor in that manner, a few stragglers landing in April, or the first days of May, and passing on their way north, never remaining long. They return in greater number, however, by the close of September, and grow fat upon the larvæ generated over the killing grounds, leaving for the south by the end of October.

9. Strepsilas interpres. TURNSTONE; "KRASS-NIE KO-LIT-SKIE," or "KRASSNIE NOGIE."

This is a very handsome bird when in full plumage, and arrives in flocks of thousands about the third week in July, taking its departure from the islands along by the 10th of September. It does not breed

17. Branta canadensis. WHITE-COLLARED GOOSE; "CHORNIE GOOSE."

This species, like the former, seems to be a mere straggler and irregular visitor, evidently driven by high winds to rest here for a brief period ere they resume their customary lines of migration along the mainland.

18. Anas boschas. MALLARD DUCK.

A pair of these fine birds bred on the island of St. Paul during the season of 1872, at Polavina Lake, and several were observed later in the fall. The mallard I also noticed on St. George Island, but the natives say it is not a regular visitor.

19. Mareca penelope. WIDGEON.

It is an interesting fact that this widgeon, as my specimens attest, which visits the Pribilof Islands is not *M. americana*, as might be anticipated, but it is the true *M. penelope*. I saw only a few specimens, and saw them rarely. They were solitary examples, never in pairs, and it does not breed on the islands. Apparently the few individuals which I noted during two years of observation were windbound or estray.

20. Harelda glacialis. LONG-TAILED DUCK; "SAAFKA."

This noisy, chattering example is common and resident. It appears everywhere on the pools, ponds, sloughs, and lakes of the two islands; in limited numbers, however. The *Saafka* is a very lively bird, particularly in the spring, when with the breaking up of the ice it flies into the open reaches of water and raises its peculiar, sonorous, and reiterated cry of *ah-naah-naăh-yah*, which rings cheerfully upon the ear after the silence and desolate dearth of an ice-bound winter.

21. Histrionicus torquatus. HARLEQUIN DUCK.

My experience with this bird is radically different from another writer, he stating that it is an essentially solitary species, found alone or in pairs, only in the most retired spots, on the small rivers flowing into the Yukon, where it breeds.[1] It is the most gregarious of all the duck tribe known to these islands. Flocks of a hundred, closely bunched together, may be found at every turn by the traveler on the coast. Nor is it particularly wild or shy, for every morning at St. George, whenever I chose to walk to the water's edge beneath the village, and less than a quarter of a mile distant, I could have shot at fifty or a hundred of these birds, just as I had enjoyed such an opportunity in the early dawning previously. But it is a remarkably silent bird, and from it I never heard any cry whatever during the whole year; for it is about the island, unless the ice drives it away, throughout that entire period. It is a very social duck, solitary pairs never being seen away from the flock. The females seem to outnumber the males two to one; but the strangest thing about it was my total inability, and that of the natives, too—for I offered an inordinate reward—to find its eggs or nest. It must breed about here, but whether deep in the rock interstices of the beach shingle, or flying by night to the high ridges inland, I am ignorant.

22. Somateria stelleri. STELLER'S EIDER.

From the village hill at St. Paul, in May, 1872, I shot two specimens of this duck, and, then not knowing as much about the seal-island

[1] Trans. Chicago Acad., i, 298.

cats as I speedily learned thereafter, the fresh-stuffed specimens were literally torn into a thousand fragments by these abominable felines. It is, as I did not see it afterwards during my residence on the group, a straggler, and nothing more.

23. **Graculus bicristatus.** RED-FACED CORMORANT; "OREEL."

As this bird of Pallas is found about the islands during the whole winter as well as the summer, despite the weather, perched on the sheltered bluffs, the natives regard it with a species of affection, for it furnishes the only supply they can draw upon for fresh meat, soups, and stews, always wanted by the sick; and were these shags sought after throughout the year near as diligently as they are during the long spell of bitter temperature that occurs here in severe winters, driving other waterfowl away, they certainly would be speedily exterminated; yet they are seldom shot, however, when anything else can be obtained. The terrible storms in February and March, when the wind "boorgas" blow as tornadoes, are unable to drive the shag away; but all other waterfowl, even the big northern gulls, depart for the open water south. It comes under the cliffs to make its nest and lay—the earliest of the birds in Bering Sea. Two eggs were taken from a bed on the reef, St. Paul Island, June 1, 1872, nearly hatched, which is more than three weeks in advance of the other waterfowls, almost without exception. The nest is large, carefully rounded up, and built upon some jutting point or narrow shelf along the face of a cliff or bluff; in its construction sea ferns (*Sertularidæ*), grass, etc., are used, together with a cement made largely of their own excrement.

The eggs are usually three in number, sometimes four, and, compared with the size of the bird, are exceedingly small. They are oval, of a dirty, whitish gray, green, and blue color, but soon become soiled; for although this bird's plumage is sleek and bright, yet it is very slovenly and filthy about the nest—the dirtiest bird of all the north when we regard its domestic economy. The young come from the shell at the expiration of three weeks' incubation, without feathers and almost bare, even of down; they grow, however, rapidly, fed by the old birds, who eject the contents of their stomachs, such as small fish, crabs, and shrimps, all over and around the nest. In about six weeks the young cormorant can take to its wings, and, strange as it may seem, it is then fully as large and heavy as the parents; but it is not until the beginning of its second year that it shimmers out in the bright plumage and metallic gloss of the adult, wearing, during the first year of probation, a dull, dingy, drab-brown coat, with the brilliant red colors at the base of the bill and gular sac subdued.

This cormorant is a stupid and very inquisitive bird. It utters no sound whatever, except when flying over, about, or around a boat or ship, which seems to possess a magnetic power of attraction for it. When it is thus hovering and circling aloft in this method it utters a low, droning croak. It can not be called a bird of graceful action at any place, either on the wing, in the sea, or perched. Its flight is a quick beating of the wings, which are usually more or less ragged at the edge, with the neck and head stretched out full length horizontal to the axis of the body. So curious is it that in flying around and around again to satisfy itself it comes close enough for an observer, should he stand erect in the bow of a boat, almost to touch it with his hand. It is very dirty on the rocks, and does not keep its nest in tidy trim like the gulls; but in regard to its plumage I frankly confess that I have sat for long intervals near a shelf upon

which fifteen or twenty of these birds were resting absorbed in true admiration of the brilliant gloss and glittering sheen of their feathers. Their coats really scintillate when in the sunlight with a confused blending of rich brownish and deep purple reflections, as though clothed in steel armor beautifully damascened.

24. Diomedea brachyura. SHORT-TAILED ALBATROSS.

This bird was the only real suggestion which arose to my mind during my sojourn on the Pribilofs of the past epoch of noted activity in the whale fisheries of the North Pacific and the Arctic, for as I first discerned the large bulk and spread of the albatross prior to shooting the natives clapped their hands and said, "You should have been here twenty years ago, when, instead of this solitary example, you would have seen thousands." They came with the whalers, and disappeared, as they had done; but, as if prompted by legends among their kind, now and then an adventurous one comes north again and looks in vain for its whale food, or the skinned carcasses rather, turned adrift by the whalemen. They were in sight of the island constantly, year in and year out, during that period of great whaling industry. The bird just cited, and this one only, was a solitary example of its kind observed by me. Two hundred miles to the southward, however, it is quite frequent about the Aleutian Islands.

25. Fulmarus glacialis. RODGER'S FULMAR; "LUPUS."

This is the only representative of the *Procellarinæ* I have seen on or about the Pribilof Islands. It repairs to the cliffs, especially on the south and east shores of St. George; comes very early in the season, and selects some rocky shelf, secure from all enemies save man, where, making no nest whatever, but squatting on the rock itself, it lays a single, large, white, oblong-oval egg, and immediately commences the duty and the labor of incubation. It is of all the waterfowl the most devoted to its charge, for it will not be scared from the egg by any demonstration that may be made in the way of throwing rocks or yelling, and it will even die as it sits rather than take flight, as I have frequently witnessed. The fulmar lays about the 1st to the 5th of June. The egg is very palatable, fully equal to that of our domestic duck; indeed, it is somewhat like it. The natives prize them highly, and hence they undertake at St. George to gather their eggs by a method and a suspension supremely hazardous, as they lower themselves over cliffs five to seven hundred feet above the water. The sensation experienced by myself when dangled over these precipices attached to a slight thong of rawhide, with the surf boiling and churning three or four hundred feet below and loose rocks rattling down from above, any one of which was sufficient to destroy life should it have struck me, is not a sensation to be expressed adequately by language; and, after having passed through the ordeal, I came to the surface perfectly satisfied with what I had called the improvidence of the Aleuts. They have quite sufficient excuse in my mind to be content with as few fulmar eggs as possible.[1] The "Lupus,"

[1] On the head at Tolstoi Mees, St. George, the natives pointed out to me a basaltic egg shelf which marked the death of one of their townsmen. It occurred in the following singular manner: He, the victim, had been very successful in securing a large basket of the first eggs of the season, and, desiring to continue the day's work, dispatched his wife back to the village with the oölogical burden, so that the basket might be emptied. Meanwhile, in her absence, he put his little tethering stake down anew, and, tying the rope of walrus or sea lion hide to it, dropped

laying so early as the 1st of June, is the only rival that the cormorant has with reference to early incubation. It never flies in flocks. It pairs early, and is then exceedingly quiet. I have never heard it utter a sound, save a low, droning croak when disgorging food for its young. The chick comes out a perfect puff ball of white down, and gains its first plumage in about six weeks. It is a dull gray black at first, but by the end of the season it becomes like the parents in coloration, only much darker on the back and scapularies. They are the least edible, with the exception of the cormorant, of all bird food found about the islands; and, like others of their family, they vomit up the putrid contents of their stomachs at the slightest provocation.

26. Stercorarius pomatorhinus. POMARINE JÄGER; "RAZ-BOI-NIK."

This bird is a rare visitor, and is the only specimen which I procured, and was the sole representative seen on the islands of its class. I found it perched in a listless attitude on the high mossy uplands between Kamminista and Polavina Sopka.

27. Stercorarius parasiticus. PARASITIC JÄGER.

I have seen but a few of these birds, also. The four or five examples of this species in my collection were all that I sighted; therefore it may be rated as an infrequent visitor. It seems to be tired out, and is found upon the grassy uplands, where it will alight and stand dozing in an indolent attitude for hours. The natives say that it is fond of the berries of the *Empetrum*, and in confirmation of their statement I found the half-digested remains of this fruit therein. No one of the three species of *Stercorarius* which I have in my hands was observed to breed here.

28. Stercorarius Buffoni. LONG-TAILED JÄGER.

Also seldom seen, and the specimen in my collection is one of the only two I ever observed on the islands. When I discovered them, July 29, 1872, they were apparently feeding upon insects and the fruit of the *Empetrum nigrum*.

29. Larus glaucus. BURGOMASTER; "CHIKIE."

This large, handsome gull, the finest of its race, is restricted in its breeding to Walrus Islet alone, although it comes sailing over and around all the islands, in easy, graceful flight, every hour of the day, and frequently late in the fall will settle down by hundreds upon the carcasses of the killing-grounds. But at Walrus Islet this bird is at home, and here lays its eggs in neat nests built of sea-ferns and dry grass, placed among the turfy tussocks on the center of the islet. No foxes are found there. It remains by the Pribilof Islands during the whole season. Though it is sometimes driven by the ice in search of open water, 50 to 100 miles south, it invariably returns soon after the floe disappears.

The "chikie" lays as early as the 1st to the 4th of June, depositing three eggs only, within a week or ten days. These eggs are large,

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over the brow of the cliff on it. A gaunt fox, which had been watching the proceedings, now ran up and fell to gnawing the rope, so taut and tense with the weight of the suspended egg hunter below. The sharp teeth of Reynard, under the circumstances instantly severed it, and the unfortunate native was dashed to the rocky shingle some 400 feet below, where his lifeless body was soon discovered. The poor fellow lost his life by having, at some earlier hour of the day, rubbed his yolk-smeared hands upon the sinewy strands, for at that place only did the hungry fox attack them.

spherically oval, have a dark, grayish-brown ground, with irregular patches of darker brown-black. They vary somewhat in size, but the shape and pattern of coloring is more constant than in any other species up here.

The young burgomaster comes from the shell at the expiration of the regular three weeks' incubation, wearing a pure white, thick coat of fluffy down, which is speedily supplanted by a brownish-black and gray plumage, with which the bird takes flight, having nearly attained the size of the parent in less than six aggregate weeks. This dark coat changes during the next three months to one nearly white, with the lavender-gray back of the adult. The legs change from a sickly, pale, grayish tone to the rich yellow gray of the mature condition, and the bill also passes from a dull brown color to a bright yellow, with a red spot at the top of the lower mandible. It has a loud, shrill, eagle-like scream, becoming more monotonous by its repetition, and it also utters a low, chattering croak while coasting. It is a very cleanly bird about its nest, and keeps its plumage in a condition of snowy purity. It is not very numerous. I do not think that there were more than five or six hundred nesting on Walrus Islet at the time of my visit in 1872.

30. Larus tridactylus var. Kotzebui. PACIFIC KITTIWAKE; "CHORNIE-NAUSHKIE GOVEROOSKIE."

This gull breeds here by tens of thousands, in company with its first cousin, *Larus brevirostris*, coming at the same time, but laying a week or ten days earlier than its relative. In all other respects it corresponds in habit and is in just about the same number. It is a remarkably constant bird in plumage coloration when adult, for I have failed to observe the slightest variation among the great numbers here under my notice. In building its nest it uses more grass and less mud cement than the *brevirostris* does. The eggs are more pointed at the small end and lighter in the ground color, with numerous splotches of dark brown. The chick is difficult to distinguish with certainty from the *brevirostris*, and it is not until two or three weeks have passed that any difference can be noted between them as to the length of bill and color of feet.

31. Larus brevirostris. RED-LEGGED KITTIWAKE; "GOVEROOSKIE."

This beautiful gull is one of the most elegant of all birds on the wing, and is, perhaps, as handsome as any known to the sight, when it rests. It seems to delight in favoring these islands with its presence, to the exclusion of other land, coming here by tens of thousands to breed. Certain it is that my specimens testify to its special abundance, and that it is by far the most attractive of all of its kind. The short, symmetrical bill, large hazel eye with crimson lids, and rich coral or vermilion-red legs and feet, contrast beautifully with the snowy-white plumage of its head, neck, lavender back, and under parts.

Like *Larus glaucus*, this bird remains about the islands during the whole season, coming on the cliffs for the purpose of nest building, breeding by the 9th of May and deserting the bluffs when the birds are fully fledged and ready for flight, early in October. It is much more prudent and cautious than the auks and the murres, for its nests are always placed on nearly inaccessible shelves and points of mural walls, so that seldom can one be reached, unless a person is lowered down to it by a rope passed over the cliff.

Nest building is commenced early in May, and completed, generally, not much before the 1st of July. It uses dry grass and moss cemented with mud, which it gathers at the fresh-water pools and ponds scattered over the islands. The nest is solidly and neatly put up; the parents work together in its construction most diligently and amiably. Two eggs are the usual number, although occasionally three will be found in the nest. If these eggs are removed, the female will renew them, like the "arrie," in the course of another week or ten days. They are of the size and shape of a common hen's egg, but covered with a dark gray ground, spotted and blotched with sepia patches. Once in a while an egg will have on the smaller end a large number of suffused blood-red spots. Both parents assist in the labor of incubation, which lasts a trifle longer than the usual time—from twenty-four to twenty-six days. The chick comes out with a pure white downy coat, a pale whitish-gray bill and feet, and rests helplessly in the nest until its feathers grow. During this period it is a comical looking object. The natives capture them, now and then, to make pets of, always having a number every year scattered through the village, usually tied by one leg to a stake at the doors of their houses, where they become very tame; and it is not until fall, when cold weather sets in, that they become restless and willingly leave their captivity for the freedom of the air. This bird is remarkably constant in its specific characters. Among the thousands and tens of thousands of them I have never observed any variation in the coloration of the bills, feet, or plumage of the mature birds, with one exception. This is a variety, seldom seen, however, in which the feet are nearly yellow, or much more yellow than red, and the edge of the eyelid is black instead of being normally scarlet; there is also a dark patch back of each eye in these odd specimens. The abnormal color of the feet is probably due to sheer accidental individual peculiarity, while the eye patch and absence of bright color from the eyelids may depend upon the season.

32. Colymbus arcticus. BLACK-THROATED DIVER.

When surveying Zapadnie, July, 1873, in measuring my angles on the beach, I came across the form of this bird, thrown up, nearly dead, by the surf, under my feet. It is the only one I have seen upon the islands, and I called the attention of the old wiseacres of the village to it. Whereupon, after much deliberation and guttural Aleutian vocalization, they informed me that they had never noticed it before around the island, though one aged man declared to the contrary, and submitted his minority report with great emphasis and much gravity. At all events, it is seldom seen here. The bird in question was a fine adult specimen, and it is interesting to observe that it is the true *Colymbus arcticus* and not var. *pacificus*, which might naturally have been expected.

33. Podiceps griseigena. RED-NECKED GREBE.

As in the case of the diver above cited, the present specimen is a typical form rather than a North American variety. It was the only specimen seen during my residence on the island. It has, however, been observed by the natives heretofore, though they affirm that it is uncommon; also, a straggler, in my opinion.

34. Fratercula corniculata. HORNED PUFFIN; "EPATKA."

My first impression when I saw one of these odd-looking birds, with its large shovel-like, lemon-yellow and red bill, as it sat squatted in glum silence on the rocky cliff perches, was one of great amusement,

and it stared back at me in stolid wonder as I laughed. Of all birds in these latitudes, it seems to have been fashioned with a special regard to the fantastic and ludicrous. This mormon, in common with one other species, *M. cirrhata*, comes up from the sea in the south to the cliffs of the islands about the 10th of May, always in pairs, never coming singly to or going away from the Pribilofs in flocks. It makes a nest of dried sea ferns, grass, and moss, slovenly laid together, far back in some deep or rocky crevice, where, when the egg is laid, it is ninety-nine times out of a hundred cases inaccessible; nothing but blasting powder would open a passage to it for man. It has this peculiarity: it is the only bird on these islands which seems to quarrel forever and ever with its mate. The hollow reverberations of its anger, scolding, and vituperation from the nuptial chamber are the most characteristic sounds, and indeed the only ones that come from the recesses of the rocks. No sympathy need be expended on the female. She is just as big and just as violent as her lord and master. The nest contains but a single egg, large, oblong, oval, pure white; and, contrary to the custom of the gulls, arries, and choochkies, when the egg is removed the sea parrot does not renew it, but deserts the nest, perhaps locating elsewhere. The young chick I have not been able to get until it becomes fledged and ready for flight in August; then it does not differ materially from its parent. Only the absence of the auricular plumes can be noted. The *Epatka* leaves the island about the 10th of September, spending, I believe, the rest of the time at sea. Except when quarreling in the nesting caverns this bird is very quiet and unobtrusive. It does not come in large numbers to the islands, for it breeds everywhere else in Bering Sea and along the northwest coast as far south as Cross Sound. Its flight is performed with quick and rapid wing beats, in a straight and steady course. There is no difference between the sexes as to shape, size, or plumage.

35. Fratercula cirrhata. TUFTED PUFFIN; "TAWPORKIE."

This bird comes to the island at about the same time as its cousin just preceding, and resembles the "Epatkie" in its habits generally, being quite as conspicuous a domestic scold. It lays a single large white egg of a rounded oval shape. I was not able to see a newly-hatched chick, owing to the retired and inaccessible breeding places, for whenever I could find an egg I seized upon it instantly, not daring to wait for the culmination of hatching. I think that Walrus Islet, if visited frequently during the close of the hatching season, would afford an opportunity to study the young, because the nests, which were the only ones from which I could get eggs, are more easy of access. The young tawporkie 6 weeks old resembles the parents exactly, only the bill is lighter colored and the plumes on the head are incipient. Walrus Islet is the only place where the birds can be daily seen and watched with satisfactory results. I took eggs from over thirty nests in July. The natives say that when it is mating its cries sound like the growling of a bear, as they issue from far down under the rocks which cover its nest.

36. Phaleris psittacula. PARROQUET AUK; "BAILLIE BRÜSHKIE."

This quaintly-beaked bird is quite common on the Pribilof group, and can be obtained at St. George in large numbers. It comes to the islands early in May, mute and silent, locating its nest in a deep chink or crevice of some inaccessible cliff, where it lays a single egg and rears its young. It is very quiet and undemonstrative during

the pairing season, its only note being a low, sonorous, vibrating whistle. Like *Simorhynchus cristatellus*, it will breed in company with the "choochkie," but will not follow that lively relative back upon the uplands, for the "baillie brüshkie" is always found on the shore line, and there only. The egg, which is laid upon the bare earth or rock, is pure white, oblong-ovate, measuring 1½ by 2½ inches. To obtain it is exceedingly difficult, owing to the bird's great caution in hiding and care in selecting some deep, winding crevice in the face of a cliff. At the entrance to this nesting cavern the parents will sometimes squat down and sit silently for hours at a time if undisturbed. It does not fly about the islands in flocks, and seems to lead an unassuming, independent life by itself, caring nothing for the society of its kind. The young when first hatched I have not seen, but by the 10th or 15th of August they may be coming out for the first time from their secure retreats and taking to wing as fully fledged as their parents. They leave the islands from the 20th of August to the 1st of September and go out upon the North Pacific for the winter, where they find their food, which consists of *amphipoda* and fish fry. I have never seen one among the thousands that were around me on the islands opening bivalve shells, such as mussels, as stated by a German author. It feeds at sea, flying out every morning and returning in the afternoon to its nest and mate. As in the case of the puffins nothing else than dynamite, or similar agency, could open the basaltic crevices in which the bird hides, and of course resort to this action would also destroy the egg. Therefore I was not able to gather much more than a baker's dozen of their eggs, though I could see at any time a thousand of the birds.

37. Simorhynchus cristatellus. CRESTED AUK; "CANOOSKIE."

This fantastic bird, the plumed knight of the Pribilof Islands, is conspicuous by reason of its curling crest and bright crimson bill. It makes its appearance in early May, and repairs to chinks and holes in the rocky cliffs, or deep down below a huge bowlder and rough basaltic shingle, to deposit its egg upon the bare earth or rock, making no nest whatever; and like the "brüshkie," so well do these birds succeed in secreting their charge, that although I was constantly upon the ground where several thousand pairs were laying I was unable successfully to overturn the rocks under which they hide, and get more than four perfect eggs, the sum total of many hundred attempts. The note of the "canooskie" while mating is a loud, clanging, *honk*-like sound; at all other seasons they are as silent as the grave. The crested auk lays but one egg, and the parents take turns, I am inclined to believe, in the labor of hatching and in that of feeding their young. The egg is rough, pure white, but with frequent discolorations, and, compared with the size and weight of the bird, is disproportionately large. It is an elongated oblong-oval, the smaller end being quite pointed. Length, 2.10; width, 1.40. I have not seen a chick, nor could I get any notes upon its appearance from the natives, but I have shot the young as they came out for the first time from their dark, secure hiding places, full fledged with the exception of their distinctive crest, being by this time, the 10th to 15th of August, as large as the old birds, and of the same color and feathering. The "canooskie," like its cousin, the "choochkie," has no sexual variation in size or plumage; males and females, to all external view, are precisely alike. The bright crimson bill varies, however, considerably in color and in its strength and curve, the slenderer bill being confined, as far as I could see, to the young birds; some old ones had very pointed beaks also.

38. Simorhynchus pusillus. LEAST, OR KNOB-BILLED AUK; "CHOOCHKIE."

I take pleasure in writing the biography of this little bird, which is the most characteristic and the most interesting one of all the water fowl frequenting the Pribilof Islands, for it comes here every summer by millions to breed. It is comically indifferent to the proximity of man, and can be approached almost within an arm's length before taking flight, sitting squatted upright and eyeing you with its peculiar "watch-ring" optics, that wear an air of great wisdom combined with profound astonishment.

Usually, about the 1st or 4th of May every year, the "choochkie" makes its first appearance around the islands for the season in small flocks of a few hundred or thousand, hovering over and now and then alighting upon the water, sporting one with the other in apparent high glee, making an incessant, low, chattering sound; but they are only the van to flocks that by the 1st or 6th of June have swarmed in upon the islands, like those flights of locusts which staggered my credulity on the Great Plains of the West. They frequent the loose stony reefs and bowlder bars on St. Paul, together with the cliffs on both islands, and what is most remarkable, they search out an area over 5 miles square of basaltic shingle on St. George Island, which lies back and over, inland from the north shore line. To the last position they come in greatest numbers. They make no nest, but lay a single egg far down below among the loose rocks, or they deposit it deep within the crevices or chinks in the faces of the bluffs.

Although, owing to their immense numbers, they seem to be in a state of great confusion, yet they pair off and conduct all of their billing and cooing down under the rocks on the spot chosen for incubation, making during this interesting period a singular croaking sound, more like a "devil's fiddle" than anything I have ever heard outside of a city's limits.

To walk over their breeding grounds at this season is highly interesting and most amusing, as the noise of hundreds and thousands of these little birds, which are directly under your feet, gives rise to an endless variation of volume of sound, as it comes up from the stony holes and caverns below; while the birds come and go, in and out, whistling around your head, comically blinking and fluttering.

The male birds, and many of the females, regularly leave the breeding grounds in the morning and go off to sea, where they feed on small water shrimps and sea fleas, returning to their nests and sitting partners in the evening. It is one of the sights on St. George, this early morning departure and the early evening return of the myriads of choochkies to their nests. The *Simorhynchus* lays a single pure white egg, exceedingly variable in size and shape, usually oblong-oval, with the smaller end pointed. I have several specimens almost spherical, and others drawn out into an elongated ellipse; but the oblong oval, with the pointed smaller end, is the prevailing type. Compared with the size and weight of the little bird, the egg is excessively large. Average length, 1.55; width, 1.12. The length of the bird, 3 inches; width, 2 inches. The general aspect of the egg is very much like that of the pigeon's, excepting the roughness of the shell. The chick is covered with a thick, uniform, dark, grayish-black down, which is speedily succeeded by feathers, all much darker than those of the parent, when it takes its flight from the island for the year, six weeks after hatching. Old birds feed their young by disgorging, never carrying anything up in their bills, and when the young leave

"CHOOCHKAMIE EDOOT!"

THE FULMAR'S NICHE.

"EPATKIE" AND "TAWPORKIE."

ORNITHOLOGICAL SKETCHES ON THE PRIBILOV ISLANDS, BY THE AUTHOR.

Herewith presented through the courtesy of Harper Brothers.

they are just as large and just as heavy as their parents. I am strongly inclined to think that the male bird feeds the female while incubating, but have not been able to verify this observation, as they are always hidden from sight at the time, and they can not be told apart by size or color.

39. Lomvia troile, var. californica. MURRE; "GUILLEMOT."

Limited numbers of the Californian guillemot are found occasionally perched on the cliffs with the arrie. They can only be distinguished at a short distance by a practiced eye, for they resemble their allies so closely and conform so strictly to their habits that it will be but repeating the description of the *L. arra*, given below, should I attempt it. The largest gathering in any one place that I have seen on the islands of these birds was a squad of about fifty on the high bluffs at St. George, but they are generally scattered by ones, twos, and threes among thousands and tens of thousands of the *arra*.

40. Lomvia arra. THICK-BILLED GUILLEMOT; "ARRIE."

This is the only egg-bird that has the slightest economic value to man on the Pribilof Islands. The bird itself is in bodily size a true counterpart of our ordinary barnyard duck, only it can not walk or even waddle as the domestic swimmer does. It lays a single egg, large and very fancifully colored—a bluish-green ground, shot with dark-brown mottlings and patches—but exceedingly variable as to definite size and color. The outline of the egg is pyriform, sometimes more acute, again more ovate. It is the most palatable of all the varieties found on the islands, except the fulmar; and when perfectly fresh I can testify to its practical equality with our deservedly prized hen's eggs. It never has any disagreeable flavor whatever, for the birds feed entirely upon marine crustacea. I have never found any fish in their craws.

This bird is the true *arra* of Pallas, a name derived undoubtedly from its striking similarity to the harsh sound uttered by the bird. It is present in immense multitudes, countless flocks, principally surrounding St. George Island, although Walrus Islet is fairly covered by them. They appear very early in the season, but are slow in laying, not beginning usually until the 18th or 25th of June. I feel quite well assured that these birds do not migrate far from Bering Sea during the most severe winters, and in the milder hyemal seasons numbers of them are around the islands during the entire year. They lay their eggs upon the points and narrow shelves, on the faces of the cliff fronts to the islands, straddling over the eggs, side by side, as thickly as they can crowd, making no nests. They quarrel desperately, but not by scolding. It is spirited action; and so earnestly do they fight, that all along below the high bluffs of the north shore of St. George, when I passed thereunder during the breeding season, I stepped over hundreds of dead birds which had fallen and dashed themselves to death upon the rocks while clinched in combat with their rivals; for they seize one another in mid-air and hang with their strong mandibles so savagely to each other's skin and feathers, that, with the swift whirring of their powerful wings, they are blinded to their peril, and strike the earth beneath ere they realize their danger and immediate death. Their curious straddling, whereby the egg is warmed and hatched, lasts nearly twenty-eight days, and then the young comes out with a dark, thick coat of down, which is supplanted by the plumage and color of the old bird in less than six weeks. They are fed by the disgorging parents, seemingly without a moment's intermission,

SEA EGGS OR SEA URCHINS: TOXOPNEUSTES.—Frequently the natives have brought a dish of sea urchins' viscera for our table, offering it as a great delicacy. I do not think any of us did more than taste it. The native women are the chief hunters for *Echinoidæ*, and during the whole spring and summer seasons they may be seen at both islands wading in the pools at low water with their scanty skirts high up, eagerly laying possessive hands upon every "bristling" egg that shows itself. They vary this search by poking with a short-handled hook into holes and rocky crevices for a small cottoid fish, which is also found here at low water in this manner. Specimens of this "kalog," which I brought down, declared themselves as representatives of a new departure from all other recognized forms in which the sculpin is known to sport; hence the name, generic and specific, *Melletes papilio*.

The "sand-cake," *Echinarachnius* sp., is also very common here.

FINE TABLE CRAB: CHIONOECETES.—By the 28th of May to the middle of June a fine table crab, large, fat, and sweet, with a light, brittle shell, is taken while it is skurrying in and out of the lagoon as the tide ebbs and flows. It is the best-flavored crustacean known to Alaskan waters; they are taken nowhere else—at St. Paul; and when on St. George I failed to see one. I am not certain as to the accuracy of the season of running, viz, 28th May to 15th June, inasmuch as that one of my little notebooks on which this date is recorded turns out missing at the present writing, and I am obliged to give it from memory. The only economic shellfish which the islands afford is embodied in the *Chionœcetes opilio* (?). The natives affirm the existence of mussels here in abundance when the Pribilof group was first discovered, but now only a small supply of inferior size and quantity is to be found.

MARINE SKELETON MAKERS: BEAUTIFUL WORK OF SEA FLEAS.—The service which swarms of *Amphidous crustaceans* rendered me in cleaning the bones of birds, fish, and even seals, can not be too highly eulogized. Only in that small bight, however, known as the "Cove," near the village of St. Paul, could I get the work done, because at no other spot on the Pribilof Islands was the sea water quiet enough. By taking common hard-bread boxes, which the company's agent gave me from the store, and substituting a slatted cover, I would, by rock ballasting, sink this with fifteen or twenty bird carcasses in the water here at low tide. When a single flow and ebb had taken place I had the box taken promptly out, never failing to find every skeleton perfectly polished, yet entirely articulated. The most delicate bones in a fish's head or fins were intact. The strong food which the blubber of the seal carcasses affords acts so as to gorge and stupefy these little ghouls of the ocean, for I did not succeed well at all with such attempts. The bones of *Callorhinus* would have to lay submerged in the cove for weeks, sometimes, ere they were eaten free of flesh, fat, etc.; then, when taken out, they would be sadly discolored by the salt water, turned black and dingy in streaks and sections.

NOTES ON THE PLANTS.

THE PRINCIPAL VEGETATION OF THE PRIBILOF GROUP: ABSENCE OF TREES.—That spruce trees can be made to live transplanted from indigenous localities to the barren slopes of the Aleutian Islands has been demonstrated; but in living, these trees scarcely grow to any appreciable degree. Evergreens were transferred to Unalaska when Veniaminov was at work there in 1830–1835. They are still standing and keep green, yet the change which such a long lapse of time should

produce by growth has been as difficult to determine as it is to find evidence of increased altitude to the mountains around them since these Sitkan trees were planted, with pious hope, at their feet fifty years ago. Though I can readily understand why the salmon berries of Unalaska should not do well on the seal islands (still I think they would at the Garden Cove of St. George), nevertheless I believe that the whortleberries of that section would thrive at many places if carefully transplanted to these localities, on the southern slopes of Cemetery Ridge at Zapadnie, the southern slopes of Telegraph Hill, and eastern fall of Tolstoi Peninsula down to the shore of the lagoon. They might also do well set out at picked places about the Big Lake and on Northeast Point, around the little lake thereon. If these bushes really throve here they would be the means of adding greatly to the comfort of the inhabitants, for the Unalaska whortleberry is an exceeding pleasant, juicy fruit, large and well adapted for canning and preserving. Having less sunshine here than at Illoolook, it may not ripen up as well flavored, but would, I think, succeed. The roots of the plants, when brought up from Unalaska in April or early May, should be kept moist by wet moss wrappings from the moment they are first taken up until they are reset, with the tops well pruned back, on the Pribilof Islands. The experiment is surely worth all the trouble of making, and I hope it will be undertaken.

THE CHARACTERISTIC "TALNEEK:" SALIX.—The only suggestion of a tree found growing on the Pribilof group is the hardy "talneek" or creeping willow; there are three species of the genus *Salix* found here, viz, *reticulata*, *polaris*, and *arctica;* the first named is the most common and of largest growth; it progresses exactly as a cucumber vine does in our gardens; as soon as it has made from the seed a sprout of 6 inches or a foot upright from the soil, then it droops over and crawls along prostrate upon the earth, rocks, and sphagnum; some of the largest talneek trunks will measure 8 or 10 feet in decumbent length along the ground, and are as large around the stump as an average wrist of man. The usual size, however, is very, very much less, while the stems of *polaris* and *arctica* scarcely ever reach the diameter of a pencil case, or the procumbent length of 2 feet.

Although *Rubus chamæmorus* is a tree shrub, and is found here very commonly distributed, yet it grows such a slender, diminutive bush, that it gives no thought whatever of its being anything of the sort. The herbs, grasses, and ferns tower above it on all sides.

FAMILIAR AND LOVELY FLOWERING PLANTS.—Perhaps no one plant that flowers on the seal islands is more conspicuous or abundant than is the *Saxifraga oppositifolia;* it rises over all localities, rank and tall in rich locations, to stems scarcely 1 inch high on the thin, poor soil of hill summits and sides; densely cespitose, with leaves all imbricated in 4 rows; and flowers almost sessile. I think that at least 10 well-defined species of this order, *Saxifragaceæ* exist on the Pribilof group. The *Ranunculaceæ* are not so numerous; but, still, a buttercup growing in every low slope, where you may chance to wander, is always a pleasant reminder of pastures at home; and, also, a suggestion of the farm is constantly made by the luxuriant inflorescence of the wild mustard, *Cruciferæ*. The chickweed, *Caryophyllacæ*, is well represented, and also the familiar dandelion, *Taraxacum palustre*. The lichens, *Thallophytes*, and the mosses, *Musci*, are in their greatest exuberance variety and beauty here; and myriads of yellow poppies, *Papaveracæ*, are nodding their graceful heads in the sweeping of the wind—they are the first flowers to bloom, and the last to fade.

PRECAUTIONS NECESSARY TO SUCCESSFUL BOTANICAL WORK.—If the following hints will serve to save the next collection of botanical specimens that may be gathered on these islands, it is not superfluous to print them here. Let the collector take a large amount of bibulous paper, and a small room all to himself; in the center of this apartment place a little stove, with an "organ" pipe; then fit up a series of broad library shelves around the walls from the floor to the ceiling; upon these shelves he will be enabled, aided by a low, steady fire, to dry the intensely juicy leguminosæ, and several other exceedingly thick and watery stemmed plants so peculiar to the Pribilof Islands, thus save their color, and prevent them from turning black; a little fire must be kept in the room all the time that the collection is in the process of curing, and also after it is ready for use, ere leaving the islands. When shipped it should be hung up, well boxed, in the fire room of the steamer, or else, if the voyage happens to be unusually foggy and dilatory, it will sweat in the hold, or cabin even, and be entirely destroyed before San Francisco is reached. I give these remarks advisedly and feelingly, for I lost the result of a hard season's work in this line of collection. By not appreciating these desiderata, another naturalist may come here as I did, be charmed with the flora, as well as the fauna, and after gathering hundreds of specimens at the expense of weary weeks of constant tramping, lose them all.

COURTESIES EXTENDED TO NATURALISTS.—The Alaska Commercial Company afforded me every facility that I had the ingenuity to ask for—giving me the unrestricted use of their men, their buildings, and their experience. Had it been the direct labor of the company instead of that in which I was engaged, I could not have had more attention paid to me and my pursuits. They stand ready to do as much again for any other accredited naturalist who may follow in my path over the Pribilof Islands while they have control; this they will possess for nearly another decade hence.

VENIAMINOV ON THE RUSSIAN SEAL INDUSTRY AT THE PRIBILOF ISLANDS.

[Translated by the author from Veniaminov's Zapieskie, etc., St. Petersburg, 1842, vol. II, pp. 568.[1]]

INDISCRIMINATE SLAUGHTER BY THE FIRST DISCOVERERS.—From the time of the discovery of the Pribilof Islands up to 1805 (or, that is, until the time of the arrival in America of General Resanov), the taking of fur seals on both islands progressed without count or lists, and without responsible heads or chiefs, because then (1787 to 1805, inclusive) there were a number of companies, represented by as many agents or leaders, and all of them vied with each other in taking as many as they could before the killing was stopped. After this, in 1806 and 1807, there were no seals taken, and nearly all the people were removed to Unalaska.

PARTIAL CHECK ORDERED.—In 1808 killing was again commenced; but the people in this year were allowed to kill only on St. George. On St. Paul hunters were not permitted this year or the next. It was not until the fourth year after this that as many as half the number previously taken were annually killed. From this time (St. George 1808, and St. Paul 1810) up to 1822, taking fur seals progressed on both islands without economy and with slight circumspection, as if there was a race in killing for the most skins. Cows were taken in the drives

[1] The italics are mine, and my translation is nearly literal, as might be inferred by *the idiom* here and there.—H. W. E.

and killed, and were also driven from the rookeries to places where they were slaughtered.

It was only in 1822 that G. Moorayvev (governor) ordered that young seals should be spared every year for breeding, and from that time there were taken from the Pribilof Islands, instead of 40,000 to 50,000, which Moorayvev ordered to be spared in four successive years, no more than 8,000 to 10,000. Since this, G. Chestyahkov, chief ruler after Moorayvev, estimated that from the increase resulting from the legislation of Moorayvev, which was so honestly carried out on the Pribilof Islands, that in these four years the seals on St. Paul had increased to double their previous number, (*that*) he could give an order which increased the number to be annually slain to 40,000; and this last order or course directed for these islands, demanded as many seals as could be got; but with all possible exertion hardly 28,000 were obtained.

POOR RESULTS.—After this, when it was most plainly seen that the seals were, on account of this wicked killing, steadily growing less and less in number, the directions were observed for greater caution in killing the grown seals and young females, which came in with the droves of killing seals, and to endeavor to separate, if possible, these from those which should be slain.

PARTIAL CHECKS AGAIN ORDERED.—But all this hardly served to do more than keep the seals at one figure or number, and hence did not cause an increase. Finally, in 1834, the governor of the company, upon the clear (*or "handsome"*) argument of Baron Wrangel, which was placed before him, resolved to make new regulations respecting them, to take effect in the same year (1834), and, following this, on the island of St. Paul only 4,000 were killed, instead of 12,000.

On the island of St. George the seals were allowed to rest in 1826 and 1827, and since that time greater caution and care have been observed, and headmen or foremen have kept a careful count of the killing.

From this it will be seen that no anxiety or care as to the preservation of the seal life began until 1805 (i. e., with the united companies).

It is further evident that all half measures, seen or not seen, were useful no longer, as they only served to preserve a small portion of the seal life, and only the last step (1834) with the present people or inhabitants has proved of benefit. And if such regulations of the company continue for fifteen years (i. e., until 1849), it may be truly said that then the seal life will be attracted quite rapidly, under the careful direction of headmen, so that in quite a short time a handsome yield may be taken every year. In connection with this subject, if the company are moderate and these regulations are carried out, the seal life will serve them and be depended upon, as shown in this volume, Table No. 2.

IDEAS OF THE OLD NATIVES.—Nearly all the old men think and assert that the seals which are spared every year (*"zapooskat kotov"*), i. e., those which have not been killed for several years, are truly of little use for breeding, lying about as if they were outcasts or disfranchised. About these seals, they show that after the seals were spared, they were always less than they should be, as, for instance, on the island of St. George, after two years of saving or sparing of 5,500 seals, in the first year they got, instead of 10,000 or 8,000, as expected, only 4,778.

WHY THE SEALS DIMINISHED.—But this diminution, which is shown in the most convincing manner, is due to wrong and injustice, because it would not have been otherwise with any kind of animals—even cattle would have been exterminated—because a great many here think and count that the seal mother brings forth her young in her third year, i. e., the next two years after her own birth. As it is well shown

here, the spared seals ("*zapooskie*") were not more than 3 years old, and therefore it was not possible to discern the correct and true numbers as they really were. Taking the females killed by the people, together with all the seals which were purposely spared, it was seen that the seal mothers did not begin to bear earlier than the fifth year of their lives. Illustrative of this is the following:

(*a*) On the island of St. George, after the first "zapooka," in 1828, the killing of 5-year-old seals was continued gradually up to five times as many as at first. With those of 5 years old the killing stopped. Then next year twelve times as many 6-year-olds were observed on the islands, as compared with their number of the last year, and with or in the seventh year came seven times as many. This shows that females born in 1828 did not begin to bear young until their fifth year, and become with young accordingly; that the large ones did not appear or come in six years (from 1828), as is evident, for in the fifth year all the females did not bring forth.

(*b*) It is known that the male seals can not become "seecatchies" (adult bulls) earlier than their fifth or sixth year. Following this, it may be said that the female bears earlier than the fourth year.

(*c*) If the male seal can not become a bull ("seecatchie") earlier than the fifth year, then, as Buffon remarks, "animals can live seven times the length of the period required for their maturity," therefore a "seecatch" can not live less than thirty years, and a female not less than twenty-eight.[1]

VENIAMINOV'S BELIEF THAT FEMALES CAN NOT BEAR YOUNG UNTIL FOUR YEARS OLD.—Taking the opinion of Buffon for ground in saying that animals do not come to their full maturity until one-seventh of their lives has passed, it goes also to prove that the female seal can not bear young before her fourth year.

It is, without doubt, a fact that female seals do not begin to bear young before their fifth year, i. e., the next four years after the one of their birth, and not in the third or fourth year. That, however, is not the rule, but the exception. To make it more apparent that females can not bear young in their third year, consider 2-year-old females, and compare them with "seecatchie" (adult bulls) and cows (adult females), and it will be evident to all that this is impossible.

Do the females bear young every year; and how often in their lives do they bring forth?

HIS DOUBTS ON THE SUBJECT.—To settle this question is very difficult, for it is impossible to make any observations upon their movements; but I think that the females, in their younger years (or prime,) bring forth every year, and as they get older, every other year. Thus, according to people accustomed to them, they may each bring forth in their whole lives from 10 to 15 young, and even more. This opinion is founded on the fact that never (except in one year, 1832) have an excessive number of females been seen without young; that cows not pregnant hardly ever come to the Pribilof Islands; that such females can not be seen every year. As to how large a number of females do

[1] This remark is sustained by the observation of old men, and especially by one of the best Creoles, Shiesneekov, who was on the island of St. Paul in 1817, and who knows of one "seecatch" (known by a bald head), which in that time had already a large herd of cows or females, surrounded and hunted by a like number of females and strong, savage old bulls; therefore, it may be safely thought that this bull did not get his growth until his fifth year, and at this time he could not have been less than 10 years old. And this same bull came every year to the island and the same place for fifteen years in succession, up to 1832, and it was only in the later years that his harem grew smaller and smaller in number.

not bear, according to the opinions and personal observations of the old people, the following may be depended upon with confidence: Not more than one-fifth of the mature or "effective" females are without young. But to avoid erroneous impressions or conflicting statements between others and myself, I have had but one season ("trayt") in which to personally observe and consider the multiplication of seals.

HIS THOUGHTS ON BIRTH OF PUPS.—There is one more very important question in the consideration of the breeding or the increase of seals, and that is, of the number of young seals born in one year, how many are males; and is the number of males always the same in proportion to the females?

Judging from the "holluschickie" accumulated from the "zapooska" in 1822–1824 on the island of St. Paul, and in 1826–27 on the island of St. George, the number of young males was widely variable; for example, on the island of St. Paul, in three years, 11,000 seals were spared, and in the following three years there were killed 7,000, i. e., about two-thirds of the number saved; opposed to this, on the island of St. George, from 8,500 seals spared in two years, less than 3,000 were taken—hardly one-third.

Why this irregularity? Why should more young males be born at one time, and at another less? Or why should there be years in which many cows do not bear young?

According to the belief of the people here, I think that of the number of seals born every year, half are males and as many females (i. e., the other half).

TABLE NO. I: ITS USE.—To demonstrate the above-mentioned conditions of seal life, the Table No. 1 has been formed of the number of seals annually killed on the Pribilof Islands, from 1817 to 1838 (when this work was ended).

From this it will be seen that—

1. No single successive year presents a good number of seals killed, as compared with the previous year; the number is always less.

2. The annual number of seals killed was not in a constant ratio.

3. And, therefore, in the regular hunting season there is less need or occasion, during the next fifteen years, to demand the whole seal kind.

4. Fewer seals were killed in those years, generally, following a previous year in which there were larger numbers of the "holluschickie;" that is, when the young males were not completely destroyed, and more were killed when the number of "holluschickie" was less.

5. The number of "holluschickie" is a true register or showing of the number of seals; i. e., if the "holluschickie" increase and exist like the young females, and conversely.

6. "Holluschickie" break from the (common) herd and gather by themselves no earlier than the third year, as seen in the case of the spared seals on the islands of St. George and St. Paul, the latter from 1822–1824 to 1835–1837, inclusive; the former from 1826–27.

7. The number of seals killed on the island of St. George, after two years ("zapooska") was resumed, and gradually increased to five times as many.

8. In the fifth year from the first "zapooska" (or saving) it became possible to count or reckon on the number remaining, and 6-year-olds began to appear twelve times as numerous, and 7-year-olds came in numbers sevenfold greater than their previous small number; and, therefore, the number of 3-year-old seals was quite constant.

9. If on the island of St. George, in 1826–27, the seals had not had this rest ("zapooska"), and the killing had been continued, even at the

diminished ratio of one-eighth, in 1840 or 1842 there would not have been a single seal left, as appears by the following table:

	Seals.		Seals.
1825	5,500	1833	1,360
1826	4,400	1834	1,190
1827	3,520	1835	1,040
1828	2,816	1836	850
1829	2,468	1837	700
1830	2,160	1838	580
1831	1,890	1839	500
1832	1,554	1840	400

10. RESULTS OF THE "ZAPOOSKA".—Following two years of "zapooska" (saving), the seal life is enhanced for more than ten years, and the loss sustained by the company in the time of "zapooskov" (about 8,500) is made good in the long run. The case may be thus stated: If the company had not spared the seals in 1826–27 they would have received, from 1826 to 1838 (twelve years), no more than 24,000, but by making this zapooska regulation for two years, they got in ten years 31,576, and, beyond this, they can yet take 15,000 without another, or any, zapooska.

11. And in this case, where such an insignificant number of seals was spared on St. George (about 8,500), and in such a short time (two years), the result was at once significant every year; that is, three times more appeared than the number spared. The result, therefore, must be large annually on the island of St. Paul, where, in consequence of the last orders or directions of the governor, already four years of saving have been in force, in which time over 30,000 seals have been left for breeding.

On this account, and in conformity with the above, I here present a table, a prophecy of the seals that are to come in the next fifteen years from 7,060 seals saved on the island of St. Paul in 1835.

On the island of St. Paul, at the direction of the governor, a "zapoosk" or saving was made of 12,700 seals; that is, before the year 1834 there were killed 12,700 seals, and on the following year, if this saving had not been made, according to the testimony of the inhabitants, no more than 12,200 seals would or could have been taken from the islands, it being thought that this number (12,200) was only one twenty-fifth of the whole; but instead of killing 12,200, only 4,052 were taken, leaving in 1835, for breeding, 8,118 fresh young seals, males and females, together.

In making this hypothetical table of seals that are to come, I take the average killing, that is, one-eighth part, and proceed on the supposition that the number of saved seals will not be less than 7,060.

In the number of 7,060 seals we can calculate upon 3,600 females; that is, a slight majority of males. With the new females born under this "zapooska" I place half of those born the first year, and so on.

Females, in the twelve or eighteen years next after their birth, must become less in number from natural causes, and by the twenty-second year of their lives they must be quite useless for breeding.

Of the number of seals which may be born during the next four years of "zapooska," or longer, we may take half for females. This number is included in the table, and the males, or "holluschickie," make up the total.

TABLE NO. II: ITS SHOWING.—From the Table II observe that—[1]

1. Old females, that is, those which in 1835 were capable of bearing

[1] The reader, in following the calculations of the Bishop, as exhibited by this table, must not forget to bear in mind, as he runs it over, that it is arranged with a sliding scale of increase that counts steadily down from 1840 to 1849; and also a sliding down scale of decrease, by reason of natural death rates, that works steadily *across these figures* of increase just specified.—H. W. E.

young, in 1850 must be canceled (minus). They probably die in proportion of one-eighth of the whole number every year.

2. For the first four years of "zapooska," until the new females begin to bear, their number will be generally less.

3. A constant number of seals will continue during the first six years of their "zapooska;" in twelve, these seals will double; in fourteen years they will have increased threefold; and after fifteen years of this "zapooska" or saving of 7,060, in the first year, 24,000 may be taken from them; in the second, 28,000; in the third, 32,000; in the fourth, 36,000; in the fifth, 41,000; thus in five years more than 160,000 can be taken. Then, under the supervision of persons who will see that one-fifth of the seals be steadily spared, 32,000 may be taken every year for a long time.

4. Moreover, from the production of fifteen years' "zapooska" there can be taken from 60,000 to 70,000 "holluschickie," which, together with 160,000 seals, makes 230,000.

5. If this "zapooska" for the next fifteen years is not made for the seal life diminution will certainly ensue, and all this time, with all possible effort, no more than 50,000 seals will be taken.

Here it should be said that this hypothetical table of the probable increase of seals is made on the supposition of the decrease of females, and an average is taken accordingly. Furthermore, on the island of St. Paul, in 1836–37, instead of 7,900 seals being killed, but 4,860 were taken. Hence it follows that these 1,500 females thus saved in two years, and which are omitted from the table, will also make a very significant addition to the incoming seals.[2]

TABLE I, PART II.—*Bishop Veniaminov's Zapieska, etc., showing the seal catch during the period of gradual diminution of life on the islands, from 1817 down to 1837.*

Taken from—	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.	1825.	1826.	1827.
St. Paul Island	47,860	45,932	40,300	39,700	35,750	28,150	24,100	19,850	24,600	23,250	17,750
St. George Island	12,328	13,924	11,925	10,520	9,245	8,319	5,773	5,550	5,500	(a)	1,950
Total	60,188	59,856	52,225	50,220	44.995	36,469	29,873	25,400	30,100	23,250	19,700

Taken from—	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.
St. Paul Island	18,450	17,150	15,200	12,950	13,150	13,200	12,700	4,052	4,040	4,220
St. George Island	4,778	3,661	2,834	3,084	3,296	3,212	3,051	2,528	2,550	2,582
Total	23,228	20,811	18,034	16,034	16,446	16,412	15,751	6,580	6,590	6,802

a Left to breed.

Grand total for St. Paul Island	464,259
Grand total for St. George Island	114,665
Total catch during nineteen years of diminution	578,924

[2] I translate this chapter of Veniaminov's without abridgment, although it is full of errors, to show that while the Russians gave this matter evidently much thought at headquarters, yet they failed to send someone on to the ground, who, by first making himself acquainted with the habits of the seals from close observation of their lives, should then be fitted to prepare rules and regulations founded upon this knowledge. These suggestions of Veniaminov were, however, a vast improvement on the work as it was conducted, and they were adopted at once; but it was not until 1845 that the great importance of never disturbing the breeding seals was recognized.—H. W. E.

TABLE II.—*Showing the number of seals that will visit the islands in the next twenty-two years—a prophecy made by Veniaminov in 1834.*

	Years.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
		1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.
1	1835	3,600	0	0	0	0	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,000	800	400	200	.....	.....	.....
2	1836	0	3,150	0	.....	.....	.....	785	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,000	700	300	100	.....	.....
3	1837	.....	0	2,755	.....	.....	.....	.....	680	918	918	918	918	918	918	918	918	918	900	600	300	10	.....
4	1838	.....	.....	.....	2,410	.....	.....	.....	.....	600	805	805	805	805	805	805	805	805	805	805	750	500	300
5	1839	.....	.....	.....	.....	2,110	.....	.....	.....	.....	450	700	700	700	700	700	700	700	700	700	700	600	400
6	1840	.....	.....	.....	.....	.....	1,845	.....	From old arrivals.			450	615	615	615	615	615	615	615	615	615	600	500
						New.	900	.....	From new comers.			152	200	200	200	200	200	200	200	200	200	150	100
7	1841	.....	.....	.....	.....	.....	.....	1,580	.....	.....	.....	.....	315	525	525	525	525	525	525	525	525	525	500
						Total new.		1,985	.....	From new ones			420	572	572	572	572	572	572	572	572	572	500
8	1842	.....	.....	.....	.....	.....	.....	.....	1,355	.....	.....	.....	.....	325	451	451	451	451	451	451	451	451	451
							Total new.		2,930	.....	From new ones			650	909	909	909	909	909	909	909	909	909
9	1843	.....	.....	.....	.....	.....	.....	.....	.....	1,130	.....	.....	.....	.....	258	376	376	376	376	376	376	376	376
								Total new.		3,768	.....	From new ones			880	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188
10	1844	.....	.....	.....	.....	.....	.....	.....	.....	.....	900	.....	.....	.....	.....	225	300	300	300	300	300	300	300
									Total new.		4,423	.....	From new ones			1,020	1,440	1,440	1,440	1,440	1,440	1,440	1,440
11	1845	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	725	.....	.....	.....	.....	180	241	241	241	241	241	241
										Total new..		5,275	.....	From new ones			1,240	1,687	1,687	1,687	1,687	1,687	1,687
12	1846	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	580	.....	.....	.....	.....	125	190	190	190	190	190
											Total new...		6,225	.....	From new ones			1,500	1,994	1,994	1,994	1,994	1,994
13	1847	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	430	.....	.....	.....	.....	100	143	143	143	143
												Total new...		7,560	.....	From new ones			1,810	2,420	2,420	2,420	2,420
14	1848	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250	.....	.....	.....	.....	61	83	83	83
													Total new...		9,083	.....	From new ones			2,254	2,908	2,908	2,908
15	1849	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....	.....	.....	.....	25	40	40
														Total new...		10,654	.....	.....	.....	.....	2,550	3,187	3,187
	Total females.	3,600	3,150	2,755	2,410	2,110	2,745	3,565	4,285	4,898	5,323	6,000	6,805	7,990	9,333	10,754	12,369	14,153	16,148	18,216	20,820	20,105	19,358
	Total males...	3,460	3,150	2,755	2,410	2,110	2,745	3,435	4,215	4,102	5,378	6,000	6,795	8,010	9,267	10,746	12,331	14,147	16,102	18,184	20,824	20,095	19,342
	All	7,060	6,300	5,510	4,820	4,220	5,490	7,000	8,500	9,700	10,700	12,000	13,600	16,000	18,600	21,500	24,700	28,300	32,250	36,400	41,640	40,200	38,700

From this table behold that—

(*a*) Every fifteen years, from 3,600 females, there can be received in sixteen years 24,700 seals; in sixteen years still more; and in twenty years 41,640.

(*b*) In the twenty-first year the incomes begin to diminish, provided that if in the meantime, or the following sixteen years, a certain number of young seals are not left to breed; and if every year a known number are left to breed, then in all following years the yield will never be less than 20,000 every year.

TABLE III.—*Calculations as to the taking of the seals on the island of St. George, made up from two years, and based upon that experience.* (*1827–'28.*)

Year.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.
1.—1826	2,200	.....	.....	.....	.....	450	700	700	700	700	700	700
2.—1827	Breeding	2,050	.....	.....	.....	.....	360	600	600	600	600	600
3.—1828	Light	.....	1,700	1,500	1,200	1,000	700	550	400	250	100	50
Females	.....	.....	.....	.....	.....	1,450	1,760	1,850	1,700	1,550	1,400	1,350
Holluschickie	2,200	2,050	1,600	1,500	1,200	.....	1,760	1,800	1,700	1,500	1,500	1,400
Total	2,200	2,050	1,600	1,500	1,200	1,450	3,520	3,650	3,400	3,050	2,900	2,750

A grand total of 29,270 seals.

The actual taking of seals was as follows:

	Seals.		Seals.
In 1828	4,778	In 1834	3,051
In 1829	3,661	In 1835	2,528
In 1830	2,834	In 1836	2,550
In 1831	3,084	In 1837	2,582
In 1832	3,296		
In 1833	3,212	Total	31,576

From this table it will be seen that up to 1838 my calculation makes a yield of 29,270 seals; while the actual result was 31,576; making a difference of 2,306.

The difference determines that the hypothesis upon which the table is based is correct.

VENIAMINOV'S ACCOUNT OF THE DISCOVERY OF THE PRIBILOF ISLANDS.[1]

LOCATION AND DISCOVERY.—Under the name of the Pribilof Islands are known two small islands lying in Bering Sea, between 56° and 57° north latitude, and 168° and 170° west longitude.

Stoörman G. Pribilof, who had been on the American Coast for some time and observed the indications of islands in Bering Sea, became convinced of their existence; and the embarrassed circumstances of his company finally induced him to attempt their discovery. * * * He was considered one of the best navigators of that region. * * *

[1]Translated, by the author, from Bishop Innocent Veniaminov's work, "Zapieska ob Ostrovah Oonahlashkenskaho Otdayla:" St. Petersburg, 1840. The only Russian treatise upon the subject found. Those selections most pertinent to the subject are introduced above in my translation. The italics are mine, and explanatory.—H. W. E.

For a long time he was in close vicinity to one of the islands subsequently named after him, but three weeks elapsed before he could get a sight of the same through the surrounding fog. At last fate or good fortune, coming to the assistance of an enterprising man, raised the curtain of the fog, and the eastern headland of the island (*Tolstoi Mees*) nearest to the Aleutian Archipelago rose up before the navigators, filling them with inexpressible joy. This island was named by them, after their ship, St. George. The "predovchik" (*or leader*) of the expedition, Yeafeem Popov, with all the hunters on the vessel, landed and remained on the newly discovered island; but the vessel, failing to find any harbor, returned to winter at the Aleutian Islands, carrying away a few fur seals and sea otters. The hunters who remained on the island of St. George sighted, on the 29th of June (*Justinian calendar*) of the following year (the day of the apostles Peter and Paul), an island to the northward, which they at once named Peter and Paul, but the name of Peter was subsequently dropped from common usage. These islands have borne, since their discovery, a variety of names. At first they were called simply "Novie" (*new*); the Pribilof; and the "predovchik" named them Laibdevskie (the principal shareholder of the company was Laibedev). Shellikov named them "Zubovie" (*this was the name of the minister of interior at that time, who was a partner and shareholder also*); but among the hunters they attained the appellation of "Saivernie" (*northern*) on account of their situation north of Unalaska, and "Kotovnie," or seal islands. At the present time (1838) they are often called simply "The Islands" in the colonies (*i. e., Alaska and Kamchatka*). The name of Pribilof, as the one most justly applied, should be used throughout.

The change from summer to winter is abrupt. The number of clear days is exceedingly small. The sun is rarely visible between the 1st of May and the middle of August, and during nearly all that time it is impossible to see beyond the distance of a few fathoms ("*sajeens*"). For this reason these islands are so difficult to find, that out of twenty ships only one succeeded in reaching them by a straight course. They are visible only during easterly winds for a brief period, * * * but the constant winds probably counteract the exhalations (*from the carcasses*). Under the present circumstances (1838) it would be impossible to remedy the trouble; to kill the animals at a greater distance from the village would require an increased number of laborers to pack the skins and meat; and if the carcasses were burned, the smoke would probably drive away the animals, while there is neither soil nor labor sufficient to bury or to burn them. The latter process would also deprive the inhabitants of their fuel, as they employ bones and putrefied meat for cooking purposes, in place of wood.

The food supply is ample even to luxury, especially on the island of St. Paul. The labor is severe, but only temporary, and the inhabitants have a great deal of time for themselves. A majority of them employ their leisure hours very well, teaching themselves and their children the rudiments of the Russian and Aleutian grammar, and with such success that of late, under the administration of the Creole, Shiesneekov, nearly all the males on St. Paul have learned to read. These people are not only richer, but more active and energetic in their labor as well as in their pious faith, than are their Aleutian brethren elsewhere; and altogether the inhabitants of St. Paul may be called the first among the Aleuts.

On account of the value of fur-seal and sea-otter skins shipped from these islands since their discovery, and up to the present time (1838),

they might be called the "Golden Islands," without estimating the 125,000 blue foxes and 50,000 sea otters shipped from there during the first thirty years (*after their discovery*).

THE VILLAGES AS THEY WERE IN 1838.—The first and most important settlement was situated at the southwestern extremity of the island (*Zapadnie*). The second, which is the present site, on the southeastern point (*Village Hill*). In the village of to-day (1838) there is a wooden chapel in honor of the apostles Peter and Paul, erected in 1821, and nicely ornamented in the interior, at the expense of the resident Aleuts; a dwelling for the manager; a store, and a magazine, all built like the church, of neatly-dressed drift logs. In addition to this, there is a "kozarmie" (*barracoon*) built after the fashion of Aleutian "oölaghamuh" (*or large, communistic, underground habitations*) houses, a few private dwellings, and 13 native barrabaras. A small windmill has been added of late.

The inhabitants subsist principally upon the flesh of fur seals and sea lions, with the addition of roots and a little flour. In the summer time, between June and September, halibut and some cod are caught around the shore, and altogether the living of these Aleuts is excellent and even luxurious, compared with that of their neighbors. The station is supplied with provisions and trading goods from Sitka, the ship arriving annually in June and July. As there is no safe harbor these vessels must receive and discharge their cargoes under sail.

In former years, up to 1820 or 1821, those islands were under the control of the Unalaska office. The manager of St. Paul was, until the year 1834, also in charge of St. George, visiting the latter island every spring in a bidarkie; and though these navigators can not see from one island to the other their journeys have been usually successful, with the exception of three occasions—twice the small craft missed the island of St. George (*going from St. Paul*), and pushed on to the coast of the Alaskan peninsula, where they finally secured a landing, and in the third instance, the bidarrah was lost altogether.

On the island of St. George there was no bay or entrance, with the exception of a shallow bight near the village (*Zapadnie*). This settlement contains a wooden chapel erected in honor of St. George, log buildings occupied by the agent of the company and his servants, and a number of barrabaras. * * * The inhabitants are, however, in less comfortable circumstances than those of St. Paul. Of provisions, they have a great abundance of sea-lion meat and sea birds and their eggs. The eggs are obtained by lowering a person over the precipitous cliffs, by means of seal-skin ropes. Many perish in this attempt from the friction of the strands against the sharp edges of the rocks; and occasionally the foxes have been known to gnaw off the ropes on which the hunters were suspended.

Occasionally shocks of earthquakes[1] still remind us of the volcanic origin of the Pribilof Islands. Very heavy ones occurred repeatedly in April on both islands, when many overhanging cliffs were thrown into the sea. The inhabitants of the Pribilof Islands belong to the parish of Unalaska, the priest of which is obliged to visit them once every two years (*to marry, baptize, etc.*). These islands were not known

[1] These shocks probably occurred in 1796–97, when Boga Slov Island was raised, in April or May of that year, from the bed of Bering Sea, 170 miles directly south of St. George. Such earthquakes were also characteristic of those subtropical fur-seal islands, Juan Fernandez and Masafuera.—H. W. E.

before the year 1786; Mate G. Pribilof,[1] then in the service of a swan-hunting company, first, in the Russian name, found them, but at the same time he was not the first discoverer, because, as before said (Part I, chap. 1), on one of them (southwest side of St. Paul) signs, such as a pipe, brass knife handle, and traces of fire, were found, indicating that people had been there before, but not long, as places were observed where the grass had been burned and scorched. But if we can believe the Aleuts in what they relate, the islands were known to them long before they were visited by the Russians. They knew and called them "Ateek," after having heard about them.

Eegaddahgeek, the son of a Unimak chief by the name of Ahkakneekak, was taken out to sea in a bidarkie by a storm, the wind blowing strong from the south. He could not get back to the beach, nor could he make any other landing, and was obliged to run before the wind three or four days, when he brought up on St. Paul Island, north from the land which he had been compelled to leave. Here he remained until autumn and became acquainted with the hunting of different animals. Elegant weather one day setting in he saw the peaks of Unimak. He then resolved to put to sea, and return to receive the thanks of his people there, and after three or four days of traveling he arrived at Unimak, with many otter tails and snouts.[2]

NO VEGETATION ON THE ISLANDS.—The islands were both at first without vegetation, with the exception of St. Paul, where there was a small talneek creeping along on the ground; and on St. George, if we believe the accounts of the first ones there to see, nothing grew, even grass, except on the places where the carcasses of dead animals rotted. In the course of time both islands were covered with grass, a great part of it being of the sedge kind. On them are two varieties of berries, etc.

EARLY STATUS OF THE COLONISTS.—The Aleuts serving the company here sustained the following relations between themselves and it, to wit: Each of them worked without solicitation and at whatever was found and to which they were directed, or at that which they understood. Payment for their toil was not established by the day or by the year, but in general for each thing taken by them or standing or put to their credit by the company. For instance, especially the skins of animals, the teeth of walrus, barrels of oil, etc. These sums, whatever they

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[1] Gehrman Pribilof, the discoverer of the seal islands, was a native of "old Russia;" his father was one of the surviving sailors of the *St. Peter*, which was wrecked, with Bering in command, November 4, 1741, on Bering Island. The only reference which I can find to him is the vague incidental expressions used here and there throughout an extended series of lengthy Russian letters, published by Techmainov, as illustrative of the condition of affairs in regard to the Russian American Company. Pribilof was, when cruising in 1783–1786 for the rumored seal grounds, merely the first mate of the sloop *St. George*. The captain and part owner was one M. Zubov, who was a member of a trading association then quite well organized in Alaska, and known as the Laibedev Lastochin Company. It does not appear that Pribilof took any part in the business of sealing, other than that of remaining in charge of the company's vessels. He died while in discharge of these duties, at Sitka, March, 1796, on his ship, *The Three Saints* ("Tree Svaytoi").

Pribilof, himself, called these islands of his discovery after Zubov; but the Russians then, and soon, unanimously indicated the group by its present well-deserved title, "Ostrovie Pribylova."—H. W. E.

[2] Here Veniaminov says that he does feel inclined to believe this story, as the peak of Unimak can be seen occasionally from St. Paul. I have no hesitation in saying that they were never observed by any mortal eye from the Pribilof group. The wide expanse of water between these points and the thick, foggy air of Bering Sea, especially so at the season mentioned in this story above, will always make the mountains of Unimak invisible to the eye from St. Paul Island. A mirage is almost an impossibility; it may have been much more probable if the date was a winter one.—H. W. E.

might be, were placed by the company to their credit, for all general hunting and working was established or fixed for the whole year fairly. The Aleuts, in general, received no specific wages, though they were not all alike or equal, there being usually three or four classes.

In these classes, to the last or least, the sick and the old workmen were counted, although they were only burdens, and therefore they received the smaller shares, about 150 rubles, and the other and better classes received from 220 to 250 rubles a year. Those who were zealous were rewarded by the company with 50 to 100 rubles. The wives of the Aleuts, who worked only at the seal hunting, received from 25 to 35 rubles.[1]

ANIMALS ON THE PRIBILOF ISLANDS.—Foxes and mice. Sometimes the ice brings bears and red foxes. The bears were never allowed to live, since they could not be made useful; and also the red foxes, as they would only spoil the breed already existing, with regard to color of the fur.

Fur seals, sea lions, hair seals, and a few walrus are the only animals that may be said to belong to the Pribilof Islands.

BIRDS.—The guillemots (or arries); gulls; puffins; crested, horned, and white-breasted auks; snow finches; geese (two kinds); a few kinds of *Tringa;* sea ducks, black and gray. Most of these birds come here to lay, and with them jägers, hawks, owls, and "chikees" (big *Larus glaucus*), and the albatross is frequently to be seen around the beaches.

Sea otters became scarce, generally, in 1811, and in the next thirty years extinct.

The fur seals ("sea cats") astonish us by their great numbers, as they gradually come up on to their breeding places, notwithstanding harsh and foolish treatment of them, continued almost half a century (until 1824) without mercy.

RUSSIAN WASTE AND SLAUGHTER.—In the first years, on St. Paul Island, from 50,000 to 60,000 were taken annually, and on St. George from 40,000 to 50,000 every year. Such horrible killing was neither necessary nor demanded. The skins were frequently taken without any list or count. In 1803 800,000 seal skins had accumulated, and it was impossible to make advantageous sale of so many skins; for in this great number so many were spoiled that it became necessary to cut or throw into the sea 700,000 pelts. If G. Resanov (our minister to Japan) had not given this his attention, and put himself between the animals and this foolish management of them, it appears plainly to me that these creatures would have long ago changed for the worse.

NO RECORDS PRIOR TO 1817: EARLY DRIVING.—Of the number of skins taken up to 1817, I have no knowledge to rely upon, but from that time and up to the present writing I have true and reliable accounts, which I put in the appendix to this volume. From these lists it will be seen that still in 1820, on both islands, there were killed more than 50,000 seals, viz, on St. Paul 39,700 and on St. George 10,250. There were eyewitnesses to the reason for this diminution of the seals, and it is only wonderful, besides, that they are still existing, as they have been treated almost without mercy so many years. The cows produce only one pup each every year. They have known deadly enemies, and also are still exposed to many foes unknown. From this killing of the seals they steadily grew less, except on one occasion, which was on St. George Island, where an opportunity was given suddenly to kill a large

[1]Compare this annual payment of the Russians with the cash settlement made every year by the Alaska Commercial Company, the present lessee of these islands, as indicated by a prior chapter on the condition of the business there.—H. W. E.

BAD REPUTATION OF PROMYSHLENIKS.—In addition to the natives themselves, the company transported to Alaska some four or five hundred Russians, who were termed "promyshleniks," or "hunters." They were employed as trappers, fishermen, seamen, soldiers, or mechanics, just as their superiors might command, and they were under the same rule as that I have just described as applicable to the natives. Their lot, according to Paul von Krusenstern, a Russian, who voyaged thither in 1804–05, seems to have been more uninviting even than that of the wretched natives.

BARANOV'S ATTEMPT TO COLONIZE CALIFORNIA.—Prior to 1812 Sitka was the extreme southern limit of the Russian-American Company. But old Baranov, greatly annoyed over the loss of supply ships from the Okotsk, by which their bread, at Kadiak and Sitka, was cut off for years at a time, determined to settle at some place south, where these necessaries to a comfortable physical existence could be raised from the soil; so he asked of the Spanish governor at Monterey permission to erect a few houses on the shore of the small bay at Bodega, California, in order to "procure and salt the meat of the wild cattle" which overran that part of the country north of the harbor of San Francisco, for the "use of the governor's table at New Archangel" (Sitka). The Castilian was happy to oblige a peer; but in the lapse of three or four years after this permit was granted the Russians had formed a large settlement, built a fort, and had in actuality taken possession of the country. The Spanish governor first remonstrated, then commanded Baranov to move off, in the name of his Most Catholic Majesty the King of Spain. He discovered quickly, to his infinite chagrin, that the Russian had abused his confidence and defied him. The Spaniard could not enforce his order, and Kuskov, the Russian deputy in charge at Bodega, openly taunted and resisted him. The Russian-American Company remained here practically unmolested until 1842, when they sold their fixtures to General Sutter, a Swiss-American, for $30,000, and vacated California.

ATTEMPT TO SECURE THE SANDWICH ISLANDS.—In 1815 Baranov, instead of feeling chilled by the California unpleasantness, then in full headway, turned his ambitious eyes to the Sandwich Islands, and actually dispatched a vessel, or rather two of them, under the direction of Dr. Shaeffer, a German surgeon, who landed on Atooi with one hundred picked Aleuts; but they were, at the lapse of a year, so discouraged by the open opposition of the Russian Government to this scheme that they abandoned the project.

RAPID DECAY OF THE RUSSIAN-AMERICAN COMPANY AFTER THE DEATH OF BARANOV.—In 1862, when the third extension of the twenty years' lease had expired, the affairs of the Russian-American Company were in a bad condition financially—deeply in debt, and the Imperial Government was not disposed to renew the charter. This state of affairs gave rise, in 1864–1867, to negotiation with other trading organizations for the lease, which finally culminated in the purchase of Alaska by our Government July, 1867. Such, in brief, was the Russian-American Company; it flourished under Baranov, but declined steadily to bankruptcy twenty years after his removal, when 80 years old, on account of extreme age, in 1818. In short, its great compeer, the Hudson Bay Company, was very much earlier initiated in the same manner, June, 1670; then it finally organized with the Northwest Company under its present title, with renewed royal prerogatives and despotic sway over all British North America in 1821. It, too, has declined to a commercial cipher to-day, with its autocratic rights abolished long

since; in 1857, I think, they were wholly rescinded. Its subsidence was due, however, to the constantly increasing white settlement of its territory.

METEOROLOGICAL ABSTRACT FOR THE MONTHS FROM SEPTEMBER, 1872, TO APRIL, 1873, INCLUSIVE.

[Being interesting as the exhibit of an unusually severe winter. Made by Charles P. Fish, United States Signal Service, St. Paul Island.]

Character of observation.	Months of record.			
	September.	October.	November.	December.
Mean of barometer, corrected	29.773	29.512	29.458	29.488
Maximum of barometer, corrected	30.46	30.04	30.23	30.04
Minimum of barometer, corrected	28.87	28.51	28.62	28.05
Monthly range of barometer, corrected	1.59	1.53	1.61	1.99
Greatest daily range of barometer, corrected	0.97	0.97	0.87	0.80
Least daily range of barometer, corrected	0.03	0.04	0.06	0.03
Mean daily range of barometer, corrected	0.259	0.293	0.339	0.249
Mean of exposed thermometer	44.2°	36°	34.3°	26.6°
Maximum of exposed thermometer	52°	45°	41°	37°
Minimum of exposed thermometer	33°	22°	23°	4°
Monthly range of exposed thermometer	19°	23°	18°	33°
Greatest daily range of exposed thermometer	11°	11°	12°	11°
Least daily range of exposed thermometer	1°	1°	1°	1°
Mean of maxima of exposed thermometer	46.8°	38.7°	36.2°	29.1°
Mean of minima of exposed thermometer	41.8°	33.3°	31.5°	24°
Mean daily range of exposed thermometer	5°	5.4°	4.7°	5.1°
Mean relative humidity	85.6	83.9	86.6	87.8
Maximum relative humidity	100	100	100	100
Minimum relative humidity	56	65	60	70
Prevailing wind	N.	N.	S.	N.
Number of miles traveled by wind	9,138	11,872	14,539	16,644
Mean daily velocity of wind	304.6	383	484.6	530.5
Mean hourly velocity of wind	12.7	16	20.2	22.1
Maximum hourly velocity of wind	33	42	74	53
Proportion of cloudiness	92	84	78.9	84
Amount of rainfall, in inches	2.89	3.08	2.38	2.99
Greatest daily amount of rainfall	0.85	0.58	0.31	0.42
Amount of melted hail and snow (included in rainfall)	0.20	0.91	0.82	2.38
Number of days on which precipitation occurred	30	29	27	27
Number of days on which hail or snow fell	4	15	17	24

Character of observation.	Months of record.			
	January.	February.	March.	April.
Mean of barometer, corrected	29.953	29.507	29.768	29.769
Maximum of barometer, corrected	30.50	30.51	30.31	30.35
Minimum of barometer, corrected	29.32	28.26	29.05	29
Monthly range of barometer, corrected	1.18	2.35	1.26	1.35
Greatest daily range of barometer, corrected	0.58	0.95	0.66	0.73
Least daily range of barometer, corrected	0.03	0.06	0.05	0.03
Mean daily range of barometer, corrected	0.194	0.421	0.219	0.242
Mean of exposed thermometer	15.7°	18.6°	12.6°	23.9°
Maximum of exposed thermometer	34°	34°	35°	35°
Minimum of exposed thermometer	—11°	--12°	—7°	3°
Monthly range of exposed thermometer	45°	46°	42°	32°
Greatest daily range of exposed thermometer	22°	28°	20°	24°
Least daily range of exposed thermometer	0°	3°	3°	3°
Mean of maxima of exposed thermometer	18.9°	22.6	17.1°	27.9°
Mean of minima of exposed thermometer	11.9°	15.1	7.4°	19.4°
Mean daily range of exposed thermometer	7°	7.5	9.7°	8.5°
Mean relative humidity	85.7	86.2	81.8	84.29
Maximum relative humidity	100	100	100	100
Minimum relative humidity	53	49	46	63
Prevailing wind	ENE.	N.	N.	N.
Number of miles traveled by wind	17,903	16,646	14,512	18,607
Mean daily velocity of wind	577.5	594.3	468.1	620.2
Mean hourly velocity of wind	24.1	24.8	19.5	25.84
Maximum hourly velocity of wind	43	82	88	53
Proportion of cloudiness	62.8	74.9	68	73.6
Amount of rainfall, in inches	0.96	5.78	1.21	1.77
Greatest daily amount of rainfall	0.39	1.07	0.38	0.50
Amount of melted hail and snow (included in rainfall)	0.83	4.87	1.21	1.77
Number of days on which precipitation occurred	21	27	27	26
Number of days on which hail or snow fell	20	25	27	26

CLASSIFICATION OF THE WINDS.—The winds here may be classified under two heads: Summer winds: Blowing fresh during June, July, and August, principally from the west-northwest, varied with light airs from the northeast, and a gale or two from the southwest, lasting a day or so. Winter winds: Stirring fresh, to gales, throughout September to June, principally from the northwest to north-northeast; the "boorgas," or snow and sleet storms, coming invariably from that direction. One or two heavy southeasters occur every fall, as a rule, in October generally; the brief lulls between blasts during this season are occupied by light southerly airs.

The summer winds are always charged with fog, while the winter gales usually blow out clear, unless accompanied with sleety spiculæ or snow. In Siberia, Wrangell says that the southwest breezes are the coldest; the north-northwest ones are such here. The southerly airs are mild; but I never felt any especial warmth when exposed to them.

CHARACTERISTICS OF BERING SEA ICE.—The descriptions which Wrangell, Demetri Laptev, and Hendenstrom have given of the behavior of the ice packs, between the Kolyma mouth and Cape Chelagsköi, were duplicated in all their details by the floes which environed St. Paul during the winter of my residence there. On the 27th of May, 1873, the ice fields around the island seemed as solid and unbroken to every point of the compass as they had for the five months preceding, and night settled over them in this shape; early in the morning of the following day I arose, and judge of my pleasant astonishment in viewing the open waters of Bering Sea on every hand; the only suggestions left of its icy fetters were the numerous scattered cakes of thickest floes, which bobbed about at wide intervals; there was little or no strong wind attending this sudden dissolution. The decomposition of the ice had taken place so secretly that its final relegation to its original form was fairly accomplished almost instantly and simultaneously, and without warning to human eyes; the alternate layering of salt, in ocean water ice, accounts for this peculiar vanishing of sea floes.

THE FAILURE OF THE BAROMETER IN BERING SEA.—Preeminent among the many difficulties in the path of the mariner who may be cruising in the Bering Sea is the fact that his barometer, which gives such timely and intelligent signals of warning, or of confidence, everywhere on the high seas of the earth is, up here, by some reason or other, wholly impotent; and does nothing to aid and everything to confuse and distress the sailor. Capt. M. C. Erskine assured me of this; and his declaration is proof positive to my mind; he is undoubtedly, by the long experience of more than fourteen consecutive seasons' sailing in and out of Bering Sea, 1867–1880 (this year's trip will make his fifteenth summer in those waters), the most thoroughly posted man living in regard to the currents, tides, winds, and waves of the northwest coast between San Francisco and Bering Strait.

With the exception of what Parry says in his narrative of his third voyage (1824), I do not find any specific mention made of this behavior of the barometer in the north; all of the Arctic seamen, unquestionably, fully understand its utter worthlessness to them. Parry declares (Harper's Family Library, p. 66, Vol. II) "the indications of the barometer previous to and during this gale deserve to be noticed, because it is only about Cape Farewell that, in coming from the northward down Davis Strait, this instrument begins to speak a language which has ever been intelligible to us as a weather glass."

During the course of my cruise in Bering Sea, July–September, 1874,

the barometer was carefully noted, and Captain Baker, of the *Reliance*, satisfied himself that the less attention he gave to it the better, as far as the success of our voyage was concerned.

THE METHOD OF DRESSING THE FUR-SEAL SKIN.

HOW SEAL SKINS ARE DRESSED.—As a matter of interest to so large a proportion of our people who delight in the possession of or covet a seal-skin sacque I have taken the liberty of republishing the following letter in a previous brochure, and, as it answers now equally well, in reply to the query as to how the natural seal skin is tanned, plucked, and dyed so as to pass the ordeal of fashionable dress parade, I herewith reproduce it, stating simply in doing so that the writer is a very successful operator and one whose work when finished from his hands is said to be always equal and often superior to the best English manufacture. It was written to me in answer to my question by the senior member of the firm undersigned:

ALBANY, *October 22, 1874.*

SIR: The Alaska Commercial Company sold in London, December, 1873, about 60,000 skins taken from the islands leased by our Government, of the catch of 1873. The remainder of the catch, about 40,000, were sold in March. This company have made the collection of seal from these islands much more valuable than they were before their lease by the care used by them in curing the skins and taking them only when in season. We have worked this class of seal for several years—when they were owned by the Russian American Fur Company and during the first year they were owned by our Government.

When the skins are received by us in the salt, we wash off the salt, placing them upon a beam somewhat like a tanner's beam, removing the fat from the flesh side with a beaming knife, care being required that no cuts or uneven places are made in the pelt. The skins are next washed in water and placed upon the beam, with the fur up, and the grease and water removed by the knife. The skins are then dried by moderate heat, being tacked out on frames to keep them smooth. After being fully dried, they are soaked in water and thoroughly cleansed with soap and water. In some cases they can be unhaired without this drying process, and cleansed before drying. After the cleansing process they pass to the picker, who dries the fur by stove heat, the pelt being kept moist. When the fur is dry, he places the skin on a beam, and while it is warm he removes the main coat of hair with a dull shoe knife, grasping the hair with his thumb and knife, the thumb being protected by a rubber cob. The hair must be pulled out, not broken. After a portion is removed the skin must be again warmed at the stove, the pelt being kept moist. When the outer hairs have been mostly removed, he uses a beaming knife to work out the finer hairs (which are shorter) and the remaining coarser hairs. It will be seen that great care must be used, as the skin is in that soft state that too much pressure of the knife would take the fur also; indeed, bare spots are made. Carelessly cured skins are sometimes worthless on this account. The skins are next dried, afterwards dampened on the pelt side, and shaved to a fine, even surface. They are then stretched, worked, and dried; afterwards softened in a fulling mill, or by treading them with the bare feet in a hogshead, one head being removed and the cask placed nearly upright, into which the workman gets with a few skins and some fine, hardwood sawdust, to absorb the grease while he dances upon them to break them into leather. If the skins have been shaved thin, as required when finished, any defective spots or holes must now be mended, the skin smoothed and pasted with paper on the pelt side, or two pasted together to protect the pelt in dyeing. The usual process in the United States is to leave the pelts sufficiently thick to protect them without pasting.

In dyeing, the liquid dye is put on with a brush, carefully covering the points of the standing fur. After lying folded, with the points touching each other, for some little time, the skins are hung up and dried. The dry dye is then removed, another coat applied, dried, and removed, and so on until the required shade is obtained. One or two of these coats of dye are put on much heavier and pressed down to the roots of the fur, making what is called the ground. From eight to twelve coats are required to produce a good color. The skins are then washed clean, the fur dried, the pelt moist. They are shaved down to the required thickness, dried, working them some while drying, then softened in a hogshead, and sometimes run in a revolving cylinder with fine sawdust to clean them. The English process does not have the washing after dyeing.

I should, perhaps, say that with all the care used many skins are greatly injured in the working. Quite a quantity of English-dyed seal skins were sold last season for $17, damaged in the dye.

The above is a general process, but we are obliged to vary for different skins. Those from various parts of the world require different treatment, and there is quite a difference in the skins from the seal islands of our country—I sometimes think about as much as in the human race.

Yours, with respect,

GEO. C. TREADWELL & CO.

H. W. ELLIOTT, Esq.

FUR-SEAL SKINS ARE OF PERMANENT VALUE.—I have frequently been asked whether, in the light of probable caprices of fashion, the value of fur-seal skins would at times shrink to a mere nominal figure, or not. I think the history of this trade during the last twenty years, at least, and since the skins have been treated for market as above recited, that this record shows the fur-seal skin to be an article of intrinsic value, just as objects of luxurious gold and silver work, of precious stones, are and always will be, no matter what the style may decree. That the demand made by the "mode" will sensibly appreciate their fixed high value is also very certain, as it does so to-day; but, withdraw it, the seal skin is still a costly purchase to the wearer and will ever be so.

BERING, NOT BEHRING.

BERING HIMSELF WROTE HIS NAME "BERING."—I do not understand the reason why a false sound should be given to this navigator's name, when our alphabet is fully equal to its correct rendition. Here is the way the Russians write it, and Bering himself signed his name Бирингъ=Bering (or Bereng), exactly in our own letter sounds. Yet this unwarranted corruption of the true equivalent of a celebrated name continues to be the common form of its expression by publication in England and this country. The Russians and the Danes sound the letter "r" in Bering precisely as we do; and the softened flattened sound of "r," indicated by *Behring*, is an error that should be avoided. It is originally a German corruption. Those Teutonic writers have made the Russian nomenclature, as translated for us, by them, look strange and sound odd to hundreds of English minds who know better; but Forster, whom I quote below, was also a German, and hence his testimony to the correct orthography of the subject in question is all the more valuable, especially so since he says in the preface to his work there cited: "The numerous researches upon which, more especially in the ancient part, and that relative to the middle ages, I was obliged to enter, the multifarious departments of learning, from which I have derived some of the following notes and remarks, the orthography of a proper name, has frequently cost me hours, and sometimes whole days."

COGENT REASONS WHY IT IS "BERING."—Also in this relation Professor Gill, of the Smithsonian Institution, informs me that "the name of the navigator, which has been conferred on the strait separating America and Asia, is unquestionably spelled Bering and not Behring. I submit, in explanation, my reasons: First. The navigator himself was born in Jutland, and a scion of a Danish family whose members bore the name of Bering and two representatives of which had the same Christian name, viz, (1) Vitus Bering, born 1617, died 1675, some time professor of poetry at Copenhagen, and (2) Vitus Bering, born 1682, died 1753, a priest of Ollerup and Kirkeby. The form Behring,

so far as I can ascertain, is unknown in Denmark (see Nyerup's Dansk-Norsk Litteratur-Lexicon, v. i, pp. 56, 57, 1818). Second. The form Bering is almost (but not quite) universally adopted in all non-English works, for example, Biographie Universelle (Michaud), v. 4, p. 261, 1811; also nouv. éd., v. 4, p. 28, 1854; Nouvelle Biographie Générale (Hoefer), v. 5, p. 527, 1855; Allgemeine Encyclopädie der Wissenschaften und Künste (Ersch und Gruber), v. 9, p. 136, 1822; Neues Konversations-Lexicon (Meyer's), v. 3, p. 238, 1862; Deutsch-Amerikanisches Conversations-Lexicon (Schem), v. 2, p. 296, 1869, and numerous others. The exceptional cases are Pierer's Universal Lexicon, Grand Dictionnaire Universel du xixe siècle, etc. In English dictionaries, the true form, Bering, is adopted in the Brief Biographical Dictionary, by Holes, 1865, and the Dictionary of Biographical Reference, by Phillips, 1871, and is gradually superseding the more familiar English form. An explanation of the reason of the origin of the name Behring, is found in the fact that it was originally derived from the Russian, without a knowledge of its primitive source, and was the supposed English phonetic expression of the Russian characters. Inasmuch, however, (1) as the original form of a name, without regard to its pronunciation, is universally adopted in our biographies and bibliographies, and (2) as the original form of the navigator's name was Bering, such is the correct one, and that which must ultimately supersede the other. It need only be added that Bering himself and the Russians universally, (?) adopt that form when writing in English characters, and that the Russian letter ('и') in his name, represented by 'eh,' is especially ordained by the Russians to be rendered by the Latin character 'e,' in accordance with the pronunciation of the Latin and continental races generally."

In addition to this clear statement by Professor Gill, I desire to add the following: John Reinhold Forster, I. U. D., who sailed around the world with Captain Cook—a man that universally commanded respect in his day as a scholar and a high-minded gentleman—in his Voyages and Discoveries in the North, London, 1783, pp. 401–402, writes: "Nevertheless, it would be still more proper to make this strait a kind of monument to the very deserving and truly great navigator, Veit Bering, by naming it, after him, Bering Straits."

THE COMMON ERROR OF "OFF" FOR "OV."—Furthermore, in this connection, it will be noticed that I do not spell the common Russian terminative "овъ" as "-off." These letters "овъ" in the Russian are sounded by their makers exactly as we would "ov" in our own alphabet. For instance, take the name "Baranov," or "Барановъ" in the Russian. The common English and German spelling in our language is "Baranoff;" but when these same writers come to "Барановичъ," instead of making it "Baranofitch," according to their first erroneous rule, they spell it correctly—"Baranovitch." In the same way they murder "Pribylov;" but did they chance to write it in the possessive it would appear correctly as "Pribylova," and not "Pribyloffa." The Russians have our letter "f" as "ф" in their alphabet, and they use it freely when they want to express that same sound of "f" in our tongue. For instance, in "Timothy" they always say "Timofay" (Тимофей); "Officer" is "Offitsar," etc.

THE UNWARRANTED "W" FOR "V."—This unsettled state of English orthography, as far as it relates to the introduction and correct rendition of Russian nomenclature, produces much embarrassment and annoyance to any writer who may seek for a fixed rule. Not only do no two authors agree, but these authorities themselves are guilty of the

inconsistencies which I have pointed out above. Thus, these German translations of the Russian have given us "Moscow," when there is no sound of "W" in the Russian language or suggestion of it in that facile and extensive alphabet of nearly forty letters. In the case of Moscow, I presume we must be guided by the authority and example of Gibbon, who declares that "some words, notoriously corrupt, are fixed, and, as it were, naturalized in the vulgar tongue. The prophet Mohammed can no longer be stripped of the famous though improper appellation of Mahomet. The well-known cities of Aleppo, Damascus, and Cairo would almost be lost in the strange descriptions of Haleb, Damashk, and Al Cahira."

HIGH TIME TO CORRECT SUCH BLUNDERS.—But, in all kindness, I submit that the name of Bering has not been so firmly travestied as has that of the Arabic chief, and ought not to be passed down misspelled on the map of the great sea and straits which perpetuate and commemorate his being; and it is high time such numberless outrage, as "Wolga" for "Volga," "Kiew" for "Kiev," "Azow" for "Azov," "Pribiloff" for "Pribylov," "Werst" for "Verst," be corrected in all future printing of Russian nomenclature.

THE LAW PROTECTING THE SEAL ISLANDS.

AN ACT to prevent the extermination of fur-bearing animals in Alaska.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful to kill any fur seal upon the islands of St. Paul and St. George, or in the waters adjacent thereto, except during the months of June, July, September, and October, in each year; and it shall be unlawful to kill such seals at any time by the use of firearms, or use of other means tending to drive the seals away from said islands: *Provided,* That the natives of said islands shall have the privilege of killing such young seals as may be necessary for their own food and clothing during other months, and also such old seals as may be required for their own clothing and for the manufacture of boats for their own use, which killing shall be limited and controlled by such regulations as shall be prescribed by the Secretary of the Treasury.

SEC. 2. *And be it further enacted,* That it shall be unlawful to kill any female seal, or any seal less than one year old, at any season of the year, except as above provided; and it shall also be unlawful to kill any seal in the waters adjacent to said islands, or on the beaches, cliffs, or rocks where they haul up from the sea to remain; and any person who shall violate either of the provisions of this or the first section of this act shall be punished, on conviction thereof, for each offense, by a fine of not less than two hundred dollars nor more than one thousand dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment, at the discretion of the court having jurisdiction and taking cognizance of the offenses; and all vessels, their tackle, apparel, and furniture, whose crew shall be found engaged in the violation of any of the provisions of this act, shall be forfeited to the United States.

SEC. 3. That for the period of twenty years from and after the passage of this act the number of fur seals which may be killed for their skins upon the island of St. Paul is hereby limited and restricted to seventy-five thousand per annum; and the number of fur seals which may be killed for their skins upon the island of St. George is hereby limited and restricted to twenty-five thousand per annum: *Provided,* That the Secretary of the Treasury may restrict and limit the right of killing, if it shall become necessary for the preservation of such seals, with such proportionate reduction of the rents reserved to the Government as shall be right and proper; and if any person shall knowingly violate either of the provisions of this section he shall, upon due conviction thereof, be punished in the same way as is provided herein for a violation of the provisions of the first and second sections of this act.

SEC. 4. That immediately after the passage of this act the Secretary of the Treasury shall lease, for the rental mentioned in section 6 of this act, to proper and responsible parties, to the best advantage of the United States, having due regard to the interests of the Government, the native inhabitants, the parties heretofore engaged in the trade, and the protection of the seal fisheries, for a term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur seals on the islands of St. Paul and St. George, and to send a vessel or vessels to

said islands for the skins of such seals, giving to the lessee or lessees of said islands a lease duly executed in duplicate, not transferable, and taking from the lessee or lessees of said islands a bond, with sufficient sureties, in a sum not less than $500,000, conditioned for the faithful observance of all the laws and requirements of Congress, and of the regulations of the Secretary of the Treasury touching the subject-matter of taking fur seals and disposing of the same, and for the payment of all taxes and dues accruing to the United States connected therewith. And in making said lease the Secretary of the Treasury shall have due regard to the preservation of the seal-fur trade of said islands, and the comfort, maintenance, and education of the natives thereof. The said lessees shall furnish to the several masters of vessels employed by them certified copies of the lease held by them, respectively, which shall be presented to the Government revenue officer for the time being, who may be in charge at the said islands, as the authority of the party for landing and taking skins.

SEC. 5. That at the expiration of said term of twenty years, or on surrender or forfeiture of any lease, other leases may be made in manner as aforesaid for other terms of twenty years; but no persons other than American citizens shall be permitted, by lease or otherwise, to occupy said islands, or either of them, for the purpose of taking the skins of fur seals therefrom, nor shall any foreign vessel be engaged in taking such skins; and the Secretary of the Treasury shall vacate and declare any lease forfeited, if the same be held or operated for the use, benefit, or advantage, directly or indirectly, of any person or persons other than American citizens. Every lease shall contain a covenant on the part of the lessee that he will not keep, sell, furnish, give, or dispose of any distilled spirits or spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine; and any person who shall kill any fur seal on either of said islands, or in the waters adjacent thereto (excepting natives, as provided by this act), without authority of the lessees thereof, and any person who shall molest, disturb, or interfere with said lessees, or either of them, or their agents or employés, in the lawful prosecution of their business, under the provisions of this act, shall be deemed guilty of a misdemeanor, and shall for each offense, on conviction thereof, be punished in the same way and by like penalties as prescribed in the second section of this act; and all vessels, their tackle, apparel, appurtenances, and cargo, whose crews shall be found engaged in any violation of either of the provisions of this section, shall be forfeited to the United States; and if any person or company, under any lease herein authorized, shall knowingly kill, or permit to be killed, any number of seals exceeding the number for each island in this act prescribed, such person or company shall, in addition to the penalties and forfeitures aforesaid, also forfeit the whole number of the skins of seals killed in that year, or, in case the same have been disposed of, then said person or company shall forfeit the value of the same. And it shall be the duty of any revenue officer, officially acting as such on either of said islands, to seize and destroy any distilled spirits or spirituous liquors found thereon: *Provided*, That such officer shall make detailed report of his doings to the collector of the port.

SEC. 6. That the annual rental to be reserved by said lease shall be not less than fifty thousand dollars per annum, to be secured by deposit of United States bonds to that amount, and in addition thereto a revenue tax or duty of two dollars is hereby laid upon each fur seal taken and shipped from said islands during the continuance of such lease, to be paid into the Treasury of the United States; and the Secretary of the Treasury is hereby empowered and authorized to make all needful rules and regulations for the collection and payment of the same, and to secure the comfort, maintenance, education, and protection of the natives of said islands, and also for carrying into full effect all the provisions of this act: *Provided*, That the Secretary of the Treasury may terminate any lease given to any person, company, or corporation on full and satisfactory proof of the violation of any of the provisions of this act or rules and regulations established by him.

SEC. 7. That the provisions of the seventh and eighth sections of an act entitled "An act to extend the laws of the United States relating to customs, commerce, and navigation over the territory ceded to the United States by Russia, to establish a collection district therein, and for other purposes," approved July 27, 1868, shall be deemed to apply to this act; and all prosecution for offenses committed against the provisions of this act, and all other proceedings had because of the violations of the provisions of this act, and which are authorized by said act above mentioned, shall be in accordance with the provisions thereof, and all acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 8. That the Congress may at any time hereafter alter, amend, or repeal this act.

Approved July 1, 1870.

AMENDED MARCH 24, 1874.—*Be it enacted, etc.*, That the act entitled "An act to prevent the extermination of fur-bearing animals in Alaska," approved July first, eighteen hundred and seventy, is hereby amended so as to authorize the Secretary

of the Treasury, and he is hereby authorized, to designate the months in which the fur seals may be taken for their skins on the islands of St. Paul and St. George, in Alaska, and in the waters adjacent thereto, and the number to be taken on or about each island respectively.

THE ORGANIZATION AND REGULATIONS OF THE ALASKA COMMERCIAL COMPANY.

BY-LAWS OF THE ALASKA COMMERCIAL COMPANY, SAN FRANCISCO, CAL.

I. The corporate name of this company is the Alaska Commercial Company, and its affairs are under the control of five trustees, who shall hereafter be chosen by the stockholders of the company on the second Wednesday of June in each year, and who shall hold office until their successors are elected. The annual meetings of the stockholders shall be held at the office of the company. At all elections of trustees by the stockholders, each stockholder shall be entitled to one vote for every share of stock held by him on the books of the company. Stockholders may vote by proxy. All proxies shall be signed by the party owning the stock represented.

II. The principal place of business of the company is San Francisco, Cal.

III. The regular meetings of the board of trustees will be held at the office of the company on the first Wednesday in each month at 12 o'clock m., and no notice of such meeting to any of the trustees shall be requisite. Other meetings of the board of trustees may be held upon the call of the president, by notice, signed by him, of the time and place of meeting, personally served on each trustee residing within this State, or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of such meeting. Special meetings may be held upon notice—signed by three trustees, stating the time and place of meeting, and the purpose for which the meeting is called—having been duly served on each trustee or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of meeting, and no business other than that specified in the notice shall be transacted at such special meeting. At all meetings of the board any three of the trustees being present shall constitute a quorum for the transaction of the business of the company. Adjourned meetings may be held in pursuance of a resolution of the board adopted at any regular or general meeting of the board. Any three trustees elected at any annual meeting of the stockholders of the company, and being present at the close of such stockholders' meeting, may, on the same day, without notice to any of the trustees, meet and organize the board by the election of officers, and may transact such other business as may come before the board at such meeting.

IV. The officers of the company shall consist of a president, a vice-president, and a secretary, who shall be chosen by the board of trustees at their first meeting after the annual election of trustees; such officers to hold office one year or until their successors are elected.

V. The president, or, in his absence, the vice-president, shall preside at the meetings of the board. In case neither is present, the board may appoint a president pro tempore.

VI. All vacancies in the board may be filled by the board at the next meeting after the existence of such vacancy, and it shall require the affirmative vote of three trustees to elect. In case of any vacancy occurring among the officers or agents of the company, the same may be filled at any meeting of the board.

VII. All certificates of the capital stock of the company shall be signed by the president and secretary, attested by the corporate seal of the company, and can be issued to the parties entitled thereto or their authorized agent. All transfers of stock shall be made on the books of the company by the secretary, upon surrender of the original certificate or certificates, properly indorsed by the party in whose favor the same was issued. No stock shall be transferred to any person not a stockholder of the company at the time of such transfer unless the same shall have been offered for sale to the company or stockholders of the company, and the purchase at the fair cash or market value refused, except by authority of a resolution of the board of trustees permitting such transfer.

VIII. The corporate seal of the company consists of a die of the following words: "Alaska Commercial Company, San Francisco, California."

IX. The corporate seal, and all property, securities, interests, and business of the company shall be under the control and general management of the president, subject to the direction of the board of trustees. The funds of the company shall be deposited (from time to time as they are received) to the credit of the company with a bank doing business in San Francisco, to be designated by the president, and the said funds can be drawn from such bank only by proper checks or drafts, signed

by the president or vice-president of the company. The books of the company shall be kept by the secretary, who shall also keep a correct record of all the proceedings of the board of trustees had at their meetings, and perform such other duties as the board of trustees may require.

X. The pay and salaries of all officers of the company shall be determined, from time to time, by the board of trustees.

XI. The president of the company shall have power to appoint and employ such general business agents, factors, attorneys, clerks, and other employees as he may deem proper and requisite for conducting the business and affairs of the company; and he shall fix the pay, commissions, or salaries of all such agents, factors, attorneys, clerks, and other employees, from time to time, as circumstances shall require.

XII. All transfers of the capital stock of this company made to persons not citizens of the United States, or made for the use or benefit of any citizen or citizens of any foreign government, are absolutely void.

XIII. Dividends from the net profits of the company may be declared and paid by order of the board of trustees, in accordance with law.

XIV. These by-laws may be altered or amended by the board of trustees in the manner prescribed by law.

REGULATIONS FOR CONDUCT OF AFFAIRS ON THE SEAL ISLANDS.

OFFICE ALASKA COMMERCIAL COMPANY,
San Francisco, January, 1872.

The following regulations are prescribed for the guidance of all concerned:

1. The general management of the company's affairs on the islands of St. Paul and St. George is intrusted to one general agent, whose lawful orders and directions must be implicitly obeyed by all subordinate agents and employees.

2.[1] Seals can only be taken on the islands during the months of June, July, September, and October in each year, except those killed by the native inhabitants for food and clothing, under regulations prescribed by the Secretary of the Treasury. Female seals and seals less than 1 year old will not be killed at any time, and the killing of seals in the waters surrounding the islands, or on or about the rookeries, beaches, cliffs, or rocks where they haul up from the sea to remain, or by the use of firearms, or any other means tending to drive the seals away from the islands, is expressly forbidden.

3. The use of firearms on the islands during the period from the first arrival of seals in the spring season until they disappear from the islands in autumn is prohibited.

4. No dogs will be permitted on the islands.

5. No person will be permitted to kill seals for their skins on the island, except under the supervision and authority of the agents of the company.

6. No vessels other than those employed by the company, or vessels of the United States, will be permitted to touch at the islands, or to land any persons or merchandise thereon, except in cases of shipwreck or vessels in distress.

7.[1] The number of seals which may be annually killed for their skins on St. Paul Island is limited to 75,000, and the number which may be so killed on St. George Island is limited to 25,000.

8. No persons other than American citizens, or the Aleutian inhabitants of said islands, will be employed by the company on the islands in any capacity.

9. The Aleutian people living on the islands will be employed by the company in taking seals for their skins, and they will be paid for the labor of taking each skin and delivering the same at the salt house 40 cents, coin, until otherwise ordered by the Secretary of the Treasury. For other labor performed for the company proper and remunerative wages will be paid, the amount to be agreed upon between the agents of the company and the persons employed. The working parties will be under the immediate control of their own chiefs, and no compulsory means will ever be used to induce the people to labor. All shall be free to labor or not, as they may choose. The agents of the company will make selection of the seals to be killed, and are authorized to use all proper means to prevent the cutting of skins.

10. All provisions and merchandise required by the inhabitants for legitimate use will be furnished them from the company's stores at prices not higher than ordinary retail prices at San Francisco, and in no case at prices above 25 per cent advance on wholesale or invoice prices in San Francisco.

11. The necessary supplies of fuel, oil, and salmon will be furnished the people gratis.

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[1] Sections 2 and 7 of the above regulations were based upon the law of July 1, 1870, but since then Congress has given the Secretary of the Treasury the power to fix the ratio for each island upon a more intelligent understanding of the subject, and also to extend the time for taking seal skins from the 1st of June up to the 15th of August.—H. W. E.

12. All widows and orphan children on the islands will be supported by the company.

13. The landing or manufacture on the islands of spirituous or intoxicating liquors or wines will, under no circumstances, be permitted by the company, and the preparation and use of fermented liquors by the inhabitants must be discouraged in every legitimate manner.

14. Free transportation and subsistence on the company's vessels will be furnished all people who at any time desire to remove from the islands to any place in the Aleutian group of islands.

15. Free schools will be maintained by the company eight months in each year, four hours per day, Sundays and holidays excepted, and agents and teachers will endeavor to secure the attendance of all. The company will furnish the necessary books, stationery, and other appliances for the use of the schools without cost to the people.

16. The physicians of the company are required to faithfully attend upon the sick, and both medical attendance and medicines shall be free to all persons on the islands, and the acceptance of gratuities from the people for such services is forbidden.

17. The dwelling houses now being erected by the company will be occupied by the Aleutian families free of rent or other charges.

18. No interference on the part of the agents or employees of the company in the local government of the people on the islands, or in their social or domestic relations, or in their religious rites or ceremonies, will be countenanced or tolerated.

19. It is strictly enjoined upon all agents and employees of the company to at all times treat the inhabitants of the islands with the utmost kindness, and endeavor to preserve amicable relations with them. Force is never to be used against them, except in defense of life, or to prevent the wanton destruction of valuable property. The agents and employees of the company are expected to instruct the native people in household economy, and by precept and example illustrate to them the principles and benefits of a higher civilization.

20. Faithful and strict compliance with all the provisions and obligations contained in the act of Congress entitled "An act to prevent the extermination of fur-bearing animals in Alaska," approved July 1, 1870, and the obligations contained in the lease to the company executed in pursuance of said act, and the regulations of the Secretary of the Treasury, prescribed under authority of said act, is especially enjoined upon all agents and employees of the company. The authority of the special agents of the Treasury appointed to reside upon the islands must be respected, whenever lawfully exercised. The interest of the company in the management of the seal-fisheries being identical in character with that of the United States, there can be no conflict between the agents of the company and the agents of the Government, if all concerned faithfully perform their several duties and comply with the laws and regulations.

21. The general agent of the company will cause to be kept books of record on each island, in which shall be recorded the names and ages of all the inhabitants of the islands, and, from time to time, all births, marriages, and deaths which may occur on the islands, stating, in cases of death, the causes of the same. A full transcript of these records will be annually forwarded to the home office at San Francisco.

22. Copies of these regulations will be kept constantly posted in conspicuous places on both islands, and any willful violation of the same by the agents or employees of the company will be followed by the summary removal of the offending party.

JOHN F. MILLER,
President Alaska Commercial Company.

General Miller, in January, 1881, was elected by the legislature of California to the Senate of the United States. He is succeeded as president of the Alaska Commercial Company by Mr. Lewis Gerstle, who is one of the original stockholders, and who has always been prominently identified with the business. The affairs of the company are now principally managed by Messrs. Gerstle, Sloss, Niebaum, and Neumann, on the Pacific Coast; by Mr. Hutchinson, at Washington, and Sir Curtis Lampson in London.

COMMENTS UPON THE LEGISLATION OF CONGRESS.

RATIO OF CATCH AT FIRST INCORRECTLY APPORTIONED.—The original text of the existing law for the protection of the seal islands provides that the 100,000 seals which may be annually taken from them

shall be proportioned by killing 75,000 on St. Paul and 25,000 on St. George. This ratio was based evidently upon the foregoing table of Veniaminov, which, if accurate, would clearly show that fully one-third as many seals repaired to the smaller island as to the larger one, and until I made my surveys, 1872–1874, it was so considered by all parties interested. The fact, however, which I soon discovered, is that St. George receives only one-eighteenth of the whole aggregate of fur-seal visitation peculiar to the Pribilof Islands, St. Paul entertaining the other seventeen parts.

REASON FOR AMENDMENT OF 1874.—This amazing difference, in the light of prior knowledge and understanding, caused me, on returning to Washington in October, 1873, to lay the matter before the Treasury Department, and ask that the law be so modified that, in the event of abnormally warm killing seasons, a smaller number might be taken from St. George, with a corresponding increase at St. Paul; for, unless this was done, it might become at any season a matter of great hardship to secure 25,000 killable seals on St. George in the short period allotted by the law of July 1, 1870. The Treasury Department, while fully concurring in my representations, seemed to doubt its power to do so; then, with its sanction, I carried the question before Congress, January, 1874, and secured from that body an amendment of the act of July 1, 1870, above quoted in full (act, etc., approved March 24, 1874), which gives the Secretary of the Treasury full discretion in the matter, and fixes the hitherto inflexible ratio of killing on each island upon a sliding scale, as it were, for adjustment from season to season, upon a more intelligent understanding of the subject; and, also, this amendatory act grants an extension of the legal limit of killing, by giving the Secretary of the Treasury power to fix it annually.

LAW WORKS WELL.—As the law is now amended, the killing on the two islands can be sensibly adjusted each season by the relative number of seals on the two islands, which will vary so markedly on St. George according as it may be abnormally dry and warm when the period for driving the "holluschickie" is at hand.[1]

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[1] Upon my urgent and persistent representations, the law directing, and appropriating for, the maintenance of a revenue cutter in Alaska waters, for the protection of the seal islands and sea-otter hunting grounds, was inserted in the sundry civil budget for 1877; and in May of that year the late Capt. George W. Bailey, in the United States Revenue-Marine cutter *Richard Rush*, sailed on that errand from San Francisco. This special service has been continued ever since, and now will remain a regularly sustained action on the part of the Department, I trust. The excellent record and efficiency of the supervision rendered by the Revenue Marine in Alaska has been so well maintained and is so apparent that I do not see how it can be suffered to fall. It is the only effective arm of the United States Government in that region, or that has ever been so. All travel in that country is essentially by water; nine-tenths of its people live by the seaside.

The fur seals of Alaska, collectively and individually, are the property of the General Government, and for their special and sole protection the extra legislation of July, 1870, was designedly enacted. Every fur seal playing in the waters of Bering Sea around about the Pribilof Islands, no matter if found so doing 100 miles away from those rookeries, belongs there, has been begotten and born thereon, and is the animal that the explicit shield of the law protects. No legal sophism or quibble can cloud the whole truth of my statement. Construe the law otherwise, then a marine license of hunting beyond a marine league (3 miles) from the shores of the Pribilof Islands would soon raise up such a multitudinous fleet that its cruising could not fail, in a few short years, in so harassing and irritating the breeding seals as to cause their withdrawal from the Alaskan rookeries and probable retreat to those of Russia—a source of undoubted Muscovitic delight and emolument, and of corresponding shame and loss to us.

The matter is, however, now thoroughly appreciated and understood at the Treasury Department, and has been during the past four years, as the seal pirates have discovered to their chagrin and discomfiture.

SPECIAL AGENTS OF THE TREASURY DEPARTMENT.—Prior to March, 1872, the supervision of the Treasury Department over its interests on the Pribilof Islands was directed by the detail of special agents from the Secretary, who paid them out of a contingent fund of $50,000, which Congress voted in 1868 for the "collection of customs" in Alaska. This appropriation running out, the Secretary drew the following bill, which Congress adopted, and it was approved March 5, 1872:

Be it enacted, etc., That the Secretary of the Treasury be, and he is hereby, authorized to appoint one agent and three assistant agents, who shall be charged with the management of the the seal fisheries in Alaska, and the performance of such other duties as may be assigned to them by the Secretary of the Treasury; and the said agent shall receive the sum of ten dollars per diem; one assistant agent the sum of eight dollars per diem; and two assistant agents the sum of six dollars each per diem while so employed; and they shall also be allowed their necessary traveling expenses in going to and returning from Alaska, such expenses not to exceed the sum of three hundred dollars in any one year.

SEC. 2. That the Secretary of the Treasury be, and is hereby, authorized to erect a dwelling house upon each of the islands of St. Paul and St. George for the use of said agents, the cost of both not to exceed the sum of six thousand dollars.

SEC. 3. That the said agents be, and they are hereby, empowered to administer oaths in all cases relating to the service of the United States, and to take testimony in Alaska for the use of the Government in any manner concerning the public revenues.

Under this law the present force of Treasury officers is creditably maintained on the Pribilof Islands. Living there, as they do, in perfect isolation, so far from headquarters, it is necessary that, to insure the personal ability of the officers to be out on the killing grounds in the sealing season, two agents at least should be detailed upon each island, as they are; should one fall sick, then the other is on hand. The work every year of taking the seals, like the moving of the tides, can not and will not wait for any man; it is literally "now or never" with its conduct.

PARAGRAPHS OF REFERENCE RELATIVE TO SUBJECTS DISCUSSED IN THE PRECEDING MEMOIR, AND REFERRED TO AS NOTE 39.

A. PREVIOUS PUBLICATIONS OF THE WRITER [Section 1].—I allude, at the outset, to the fact that a brief digest of my surveys had been published by the Government in 1873–74. It is entitled Condition of Affairs in Alaska: 8°, 1874. This report was principally given up to the state of the fur trade over all Alaska, the people and resources thereof. It also contains the substance of a still briefer report of mine made upon the Pribilof Islands in September, 1873, and was printed by the Treasury Department during my absence in Alaska. Owing to causes of which I have necessarily no personal knowledge, only 75 copies of this report were struck off. It was illustrated by 50 quarto plates photographed from my drawings and paintings.

B. ST. FELIX MUST NOT BE CONFOUNDED WITH MASAFUERA [Section 2].—The overshadowing number of fur seals found on Masafuera and Juan Fernandez islands, just to the southward of this island, has caused a great deal of confusion as to the existence, or not, of *Arctocephalus* on this island and Ambrosia Islet, in the old records and statements of Antarctic fur sealers. It has, however, never been a very prominent rookery, but it has been one, nevertheless, and hence I give its name.

A fur-seal skin was taken from either the Straits of Le Maire or Juan Fernandez as early as 1686, and presented to the Museum of the Royal Society in London. Here it was first noticed as new by Dr. Grew, in

1694; but the name of the donor and the locality being unknown, the matter was allowed to drop by naturalists, and Grew's descriptions were laid aside by them as obscure and apocryphal. Indeed, even as late as 1823, Baron Cuvier said of the Grew diagnosis, "Que faire de ce phoque—Que faire de cette otarie?" (Dict. Class. d'Hist. Nat., tome XIII.)

I say that this specimen was taken from the above localities, in all probability, because, unless it came from the Falkland Islands, there were no other fur-seal grounds known to navigators at so early a date. Spanish and English buccaneers were, however, familiar with Juan Fernandez and Masafuera as soon as 1574–1586, or a full century prior to the receipt of the Grew specimen. These sea pirates, however, prided themselves over their swords alone; so we have no record of what they really knew or did. Nevertheless, some of them evidently employed a leisure hour or day in securing and transmitting the skin above referred to. In summing up, therefore, Henry Brewer, in 1646, at Staten Land, first noticed the southern fur seal. William Dampier, in 1683, first called specific attention to it as a fur seal, and Dr. Grew, as above stated, first described it formally as a new seal to natural science. So much is due to the true literature of the Antarctic fur seal.

C. PRIBILOF'S DISCOVERY OF THE ISLANDS [Section 3].—"Anglieskie Boökta," or English Bay, so called by the natives because in 1849 a large English whale (?) ship was stranded on the shoals of that reach of the coast, and the wreck driven ashore there.

D. LAND AND SCENERY [Section 4].—This village lagoon has been filling up very perceptibly since 1868, when Hutchinson and Morgan then were able to sail in a small sloop, drawing 6 feet of water, up to its head. To-day such a vessel could not come nearer than half a mile to their anchorage of 1868. The principal shoaling takes place in a direct line here between Tolstoi Mees and the Village Hill, where a rocky reef seems to be slowly rising, pushed up by ice fields. The sloop yacht *Jabez Howe*, which was wrecked in 1873 on Akootan, is probably the last seagoing vessel that has or ever will gain an entrance to the village lagoon, St. Paul Island, or swing at anchor in the cove.

E. ST. PAUL [Section 4].—The physical difficulties of pedestrianism here recall vividly to my mind the recent death of Mr. Edward Gill, a brother of the distinguished naturalist, Professor Gill, of the Smithsonian Institution. Late in October, 1876, this young man, in company with several of the natives and two agents of the Alaska Commercial Company, started out one bright morning for a walk, intending to go to Northeast Point, then to return by Nahsayvernia to English Bay, and home to the village in the evening. They had journeyed on this route as far as Maroonitch, at the north shore, when a storm of wind and sleet arose which blew directly in their faces as they came across the island to English Bay. Gill sank several times from exhaustion, caused by the severe exercise of walking in the sphagnum on Boga Slov and of jumping over the tussocks near the bay. Finally, at the head of the lagoon, and in sight of the village lights, he dropped into the long grass utterly prostrated. His companions, too weak to carry him farther, struggled on, and when the relief party found him he was warm, but life had departed. He was in perfect health and condition at the starting; but the chill fury of the icy gale had compassed his death.

F. Resident natives of St. Paul, July 1, 1870, taken from Philip Volkov's lists, August 8, 1873. [Section 5.]

[The names in italics were either dead or absent from the island at the date of copy, August 8, 1873.]

1. *Philip Keemachneek.*
2. *Effroseenia, his wife.*
3. *Ivan, his son.*
4. *Danelo, his son.*
5. Vasseele Seedulee.
6. *Mareena, his wife.*
7. *Alexander, his son.*
8. Sylvester, his son.
9. *Eefeem Anoolanak.*
10. *Matroona, his wife.*
11. *Simeon, adopted son.*
12. *Marka Aveelyah.*
13. *Feeleechat, his wife.*
14. Peter Peeshenkov.
15. Matroona, his wife.
16. Ivan Eemanov.
17. Anna, his wife.
18. Yeagor, his son.
19. Loobov, his stepdaughter.
20. Maxseem, his stepson.
21. Maria, his niece.
22. Nickolai Krukov.
23. Peter Krukov.
24. Agrafeena, his wife.
25. Ivan Korchootin.
26. Ooleeana, his wife.
27. Yahkov Korchootin.
28. Lookahria, his sister.
29. *Natalia Makooleena.*
30. Maria Paranchina.
31. Keesar Shabbylean.
32. Agrafeena, his wife.
33. Neekon, his son.
34. *Ripsimia Plottnikova.*
35. Avdotia, her daughter.
36. Prokoopee Meeseekin.
37. Eveduxsia, his wife.
38. Avdotia Meeseekina, his stepmother.
39. Anna, daughter of Meeseekin.
40. Deemeetree Veatkin.
41. Evelampia Veatkin.
42. Balakshin (Benedict).
43. Matroona, his wife.
44. Meexhae, his son.
45. Balakshin, second (Benedict).
46. Stepan Krukov.
47. Natalie, his wife.
48. Avdokia Seeribneekova (widow).
49. Timofay, her son.
50. Olga, her daughter.
51. Paraskeevee, her daughter.
52. Akooleena, her daughter.
53. Michael Barrhov.
54. Malania, his wife.
55. Agnes, his daughter.
56. Daniel, his nephew.
57. Avdotia Schepeteenah (widow).
58. Tahreentee, her son.
59. Elasie, her son.
60. Hee-une-iah, her daughter.
61. Kerick Booterin, first chief.
62. Seeg-lee-teekiah, his wife.
63. *Patalamon, his son.*
64. Kerick, his son.
65. Salomayee, his daughter.
66. Ooleeta, his daughter.
67. George Booterin, his son.
68. Carp Booterin.
69. Lookariah Booterin.
70. Alexander Pancov.
71. Porfeerie, his son.
72. Avdotia, his stepdaughter.
73. Paraskeevie, his stepdaughter.
74. Yakov Sootyahgin.
75. Eeroadea, his wife.
76. Feedosayee Saydeek.
77. *Anesia, his wife.*
78. *Anna, his daughter.*
79. *Feoktista, his godmother.*
80. Dayneese Saydeek.
81. *Baiz yahzeekov (Evlampia).*
82. *Anna, his wife.*
83. *Maria, his daughter.*
84. Maroon Nakock.
85. Paraskeevie, his wife.
86. Zachar, his stepson.
87. ——, his nephew.
88. Paraskeevie, niece.
89. Natalia Habaroova.
90. Pavel Habarov, her son.
91. *Paul Shies-neekov (priest).*
92. *Meeh-ah-elo (his son).*
93. Meeloveedova, Alexsandra (widow).
94. Simeon, her son.
95. *Alexsandra, her daughter.*
96. Antone, her son.
97. Marcia, her daughter.
98. Kerick Artamanov.
99. Olga, his wife.
100. Melania, his daughter.
101. Vasseleesee, his daughter.
102. Kah-sayn-yah, his daughter.
103. Gearman Artamanov.
104. Anna Tarantayvah (widow).
105. Anna, her daughter.
106. Stephen Bayloglazov.
107. Yealeena, his wife.
108. *Sayrgee, his son.*
109. Anna, his daughter.
110. Paraskeevie, his adopted girl.
111. Ermolie Cushing.
112. Faokla, his wife.
113. Faokla, his daughter.
114. Oolyahnah, his daughter.
115. Aggie Cushing, his son.
116. Antone Sootyahgen.
117. Oolyahnah, his wife.
118. Meetrofan, his son.
119. *Meehaie, his son.*
120. Yahkov Mandrigan.
121. Afanashia, his wife.
122. *Lookayleean, his son.*
123. Maria, his daughter.
124. Oseep Pahomov.
125. Varvarah, his wife.
126. Maria Seedova (widow).
127. Ahkakee, her son.
128. ——, her daughter.
129. ——, her daughter.
130. ——, her daughter.
131. ——, her daughter.
132. Alexsayee Neederazov.
133. Akooleena, his wife.
134. Christeena, his daughter.
135. Agrafeena, his daughter.
136. Keer Saydeek.
137. Yealeena, his wife.
138. *Maria, his daughter.*
139. Ivan Mandrigan.
140. Tatahyahn, his wife.
141. Vasseelee, his son.
142. Marfa, his daughter.
143. Feelat Teetov.
144. Peter, his son.
145. Yeaon, his son.
146. Yeagor Arkashav.
147. Alexsandra, his wife.
148. Martin, his stepson.
149. Nekolaie, his stepson.
150. Stepan, his stepson.
151. Kereek, his son.
152. Arsaynee, his son.
153. Tatayahnah, his daughter.
154. Timofay Evanov.
155. Fevronia, his daughter.
156. Paymen Kooznitzov.
157. Oseep Baizyahzeekov.
158. Alexsandra, his wife.
159. Paul, his son.
160. Kahsaynyah, his stepdaughter.
161. Avdokia, his stepdaughter.
162. *Kahsaynyah, his daughter.*
163. *Ivan Paranchin.*
164. Zaharrov Evemainov.
165. Keereenayah, his wife.
166. Fevronia, his daughter.
167. Ivan Hapov.
168. Anna, his sister-in-law.
169. *Alexsandra, his daughter.*
170. Ivan, his son.
171. Yeagor Korchootin.
172. Zachar Saydeek.
173. Ooateenia, his wife.
174. Vasseelet, his son,
175. Marvra, his daughter.
176. *Nekon, his nephew.*
177. Feelip Saydeek.
178. Stepan Skahvortsov.
179. Philip Vollkov.
180. Ellen, his daughter.
181. Matroona, his daughter.
182. Markiel Vollkov, his son.
183. Gavreelo Korchurgin.
184. Lukaylean, his son.
185. *Ivan Sootyahgen.*
186. Heeyoniah, his wife.
187. Aneesia, his daughter.
188. Emelian Sootyahgen.
189. Marko Korchootin.
190. Dareyah, his wife.
191. Ivan, his son.
192. Zeenovia, his daughter.
193. Timofay Glottov.
194. Maria, his wife.
195. ——, his son.
196. Ivan, his son.
197. Yeafeemia, his daughter.
198. Iraklin Mandrigan.
199. Ooateenie, his wife.
200. Eeon, his son.
201. Paul Soovorrov.
202. Vassa, his wife.
203. ——, *his son.*
204. Akyleena, his mother.
205. *Agrafeena, his adopted girl.*
206. Yeafeem Korchootin.
207. Palahgayee, his wife.
208. *Peter, his son.*
209. Luka Mandrigan.
210. Eereena, his wife.
211. Neekeeta Yitchmainov.
212. Christeena, his daughter.
213. Domenah, his daughter.
214. Taheesah, his daughter.
215. Ivan Yitchmainov.
216. Michael Korzerov.
217. Alexsandra, his wife.
218. Stepan Korzerov.
219. Paul Korzerov.
220. *Ivan Kozlov.*
221. Palahgayah, his mother.
222. Feodar, her son.
223. *Eveducksia, her daughter.*
224. Platone Tarakanov.
225. Marfa, his wife.
226. *Akoolena, his mother.*
227. Kerick Tarakanov.
228. Domian M. Kok (Jol Frater).
229. Oolyahnah, his wife.
230. Anna, his daughter.
231. Salomayah, Artamanov daughter.

White men in charge.

1. Dr. McIntyre.
2. H. W. McIntyre.
3. Dr. Cramer.
4. *John M. Morton.*
5. Chas. Bryant.
6. D. Webster.
7. ——, a cooper.
8. ——, a carpenter.

WHAT CONSTITUTES A NATIVE OF ST. PAUL.—There has been some petty divergence of opinion on the island as to who are the real "natives" thereof, because these natives enjoy certain privileges that are very valuable to them and coveted by all outside Alaskan brethren.

In this connection the people living here are divided into three classes—that is, the males:

First. The natives, properly speaking, or those who have been born and raised upon the Pribilof Islands. Not over one-quarter of the present adult population can lay claim to this title.

Second. The people who were living thereon but not born natives at the time of the transfer of all Alaska, July, 1867. This class constitutes a majority of the citizens of the two islands as they exist to-day.

Third. The people who were living and working as sealers on the Pribilof Islands at the date of the granting by the Government of the present lease to the Alaska Commercial Company, August 31, 1870.

Of the above three divisions, strict justice and true equity unite in recognizing the third class as the natives of the Pribilof Islands. This settles the question also to the best satisfaction of these people themselves and removes every quibble of dispute in the premises. Accurate records of the men, women, and children living on each island at the date of the lease in 1871 can be found in the church registers on both St. Paul and St. George.

CURIOUS DERIVATION OF NATIVES' NAMES.—Anyone at all acquainted with the Russian language will not fail to notice that the names in the above list have some odd derivations, relating to physical peculiarities, defects, and other originations that are more or less comical in their suggestions. I was told by a very bright Russian, who spent a season here—1871–72—as special agent of the Treasury Department, that the Aleutian ancestors of these people, when they were converted and baptized into the Greek Catholic Church, received their names, bran new, from the fertile brains of the priests, who, after exhausting the common run of Muscovitic titles, such as our Smiths and Joneses, were compelled to fall back upon some personal characteristics of the new claimant for civilized nomenclature. Thus we have to-day on the seal islands a "Stepan Bayloglazov," or "Son of a White Eye;" "Oseep Baizyahzeekov," or "Son of a Man without a Tongue." A number of the old Russian governors and admirals of the imperial navy are represented here by their family names, though I do not think, from my full acquaintance with the namesakes, that the distinguished owners in the first place had anything to do with their physical embodiment on the Pribilof Islands.

CAUSES OF DEATH AMONG THE PEOPLE.—The principal cause of death among the people, by natural infirmity, on the seal islands is the varying forms of consumption and bronchitis, always greatly aggravated by that inherited scrofulous taint or stain of blood which was in one way or another flowing through the veins of their recent progenitors both here and throughout the Aleutian Islands. There is nothing worth noticing in the line of nervous diseases, unless it be now and then the record of a case of alcoholism superinduced by excessive quas drinking. This "makoolah" intemperance among these people, which was not suppressed until 1876, was a chief factor to the immediate death of infants, for, when they were at the breast, the mothers would drink quas to intoxication, and the stomachs of the newly born Aleuts or creoles could not stand the infliction which they received, even secondhand. Had it not been for this wretched spectacle, so often presented to my eyes in 1872–73, I should hardly have taken the active

steps which I did to put the nuisance down, for it involved me at first in a bitter personal controversy, which, although I knew at the outset it was inevitable, still weighed nothing in the scales against the evil itself.[1]

A few febrile disorders are occurring, yet they yield readily to good treatment. The chief source of sickness used to arise from the wretched character of the barrabkies in which they lived; but it was, at first, a very difficult matter to get frame houses to supplant successfully the sod-walled and dirt-roofed huts of the islands.

DIFFICULTY OF GETTING SUITABLE HOUSES.—Many experiments, however, were made, and a dozen houses built, ere the result was as good as the style of primitive housing, when it had been well done and kept in best possible repair. In such a damp climate, naturally, a strong moldy smell pervades all inclosed rooms which are not thoroughly heated and daily dried by fires; and in the spring and fall frost works through and drips and trickles like rain adown the walls. The present frame houses occupied by the natives owe their dryness, their warmth, and protection from the piercing "boorgas" to the liberal use of stout tarred paper in the lining. The overpowering mustiness of the hallways, outhouses, and, in fact, every roofed-in spot, where a stove is not regularly used, even in the best-built residences, is one of the first disagreeable sensations which the new arrivals always experience when they take up their quarters here. Perhaps, if it were not for the nasal misery that floats in from the killing-grounds to the novice, this musty, moldy state of things up here would be far more acute, as an annoyance, than it is now. The greater grief seems to soon fully absorb the lesser one; at least in my own case I can affirm the result.

AMIABLE CHARACTER OF THE NATIVES.—These people are singularly affectionate and indulgent toward their children. There are no "bald-headed tyrants" in our homes as arbitrary and ruthless in their rule as are those snuffly babies and young children on the seal islands. While it is very young, the Aleut gives up everything to the caprice of his child, and never crosses its path or thwarts its desire; the "deetiah" literally takes charge of the house; but as soon as these callow members of the family become strong enough to bear burdens and to labor, generally between 12 and 15 years of age, they are then pressed into hard service relentlessly by their hitherto indulgent parents. The extremes literally meet in this application.

They have another peculiarity: when they are ill, slightly or seriously,

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[1]This evil of habitual and gross intoxication, under Russian rule, was not characteristic of these islands alone; it was universal throughout Alaska. Sir George Simpson, speaking of the subject, when in Sitka, April, 1842, says: "Some reformation certainly was wanted in this respect, for of all the drunken as well as of all the dirty places that I had visited, New Archangel [Sitka] was the worst. On the holidays in particular, of which, Sundays included, there are 165 in the year, men, women, and even children were to be seen staggering about in all directions." (Simpson: Journey Around the World; 1841–42, p. 88.)

Surprise has often been genuine, among those who inquire, over the fact that there is no law officer here at either village, and wonder is expressed why such provision is not made by the Government. But when the following facts relative to this subject are understood it is at once clear that a justice of the peace and his constabulary would be entirely useless if established on the seal islands. As these natives live here, they live as a single family in each settlement, having one common purpose in life, and only one; what one native does, eats, wears, or says is known at once to all the others, just as whatsoever any member of our household may do will soon be known to us all who belong to its organization; hence, if they steal or quarrel among themselves they keep the matter wholly to themselves and settle it to their own satisfaction. Were there rival villages on the islands and diverse people and employment, then the case would be reversed and need of legal machinery apparent.

no matter which, they maintain or affect a stolid resignation, and are patient to positive apathy. This is not due to deficiency of nervous organization, because those among them who exhibit examples of intense liveliness and nervous activity behave just as stolidly when ill as their more lymphatic townsmen do. Boys and girls, men and women, all alike are patient and resigned when ailing and under treatment; but it is a bad feature, after all, inasmuch as it is well-nigh impossible to rally a very sick man who himself has no hope, and who seems to mutely deprecate every effort to save his life.

DISPOSITION TO GAMBLE.—The inherent propensity of man to gamble is developed here to a very appreciable degree, but it in no way whatever suggests the strange gaming love and infatuation with which the Indians and Eskimo elsewhere of Alaska are possessed. The chief delight of the men and boys of the two villages is to stand on the street corners "pitching" half dollars; so devoted, indeed, have I found the native mind to this haphazard sport that frequently I would detect groups of them standing out in pelting gales of wind and of rain "shying" the silver coin at the little dirt-driven pegs. A few of them, men and women, play cards with much skill and intelligence.

CHILDREN'S SPORTS.—The urchins play marbles, spin tops, and fly kites intermittently with all the feverish energy displayed by the youth of our own surroundings; they frolic at baseball and use "shinny" sticks with much volubility and activity. The girls are, however, much more repressed, and though they have a few games and play quietly with quaintly dressed dolls, yet they do not appear to be possessed of that usual feminine animation so conspicuously marked in our home life.

ATTACHMENT TO THE ISLANDS.—The attachment which the natives have for their respective islands was well shown to me in 1874. Then, a number of St. George people were taken over to St. Paul temporarily to do the killing incidental to a reduction of the quota of 25,000 for their island and a corresponding increase at St. Paul; they became homesick immediately, and were never tired of informing the St. Paul natives that St. George was a far handsomer and more enjoyable island to live upon; that walking over the long sand reaches of "Pavel" made their legs grievously weary, and that the whole effect of this change of residence was "ochen scootchnie." Naturally the ire of the St. Paul people rose at once and they retorted in kind, indicating the rocky surface of St. George and its great inferiority as a seal island. I was surprised at the genuine feeling on both sides, because, as far as I could judge from a residence on each island, it was a clear case of tweedledee and tweedledum between them as to opportunities and climate necessary for a pleasurable existence. The natives themselves are of one and common stock, though the number of creoles on St. George is relatively much larger than on St. Paul; consequently the tone of the St. George village is rather more sprightly and vivacious.

CREATURE COMFORTS.—As far as a purely physical existence goes, the American method of living on and in the climate of the Pribilof Islands is highly conducive to strength and health. Tea and coffee, seasoned with condensed milk and lump sugar; hot biscuits, cakes, and waffles; potatoes, served in every method of cookery; salt salmon, codfish, and corned beef; mess pork; and, once a week, a fresh roast of beef or steaks; all the canned vegetables and fruits; all the potted sauces, jams, and jellies; pies, puddings, and pastries; and the exhaustive list of purely seafaring dishes, such as pea and bean, barley and rice soups, curries, and macaroni; these constitute the staples and many of the luxuries with which the agents of the Alaska Commercial

Company prolong their existence while living here in the discharge of their duties, and to which they welcome their guests for discussion and glad digestion.

A piano on St. Paul in the company house, an assorted library, embracing over 1,000 volumes, selected from standard authors in fiction, science, and history, together with many other unexpected adjuncts of high comfort for body and soul, will be found on these islands, wholly unexpected to those who first set foot upon them. A small Russian printed library has also been given by the company to the natives on each island for their special entertainment. The rising generation of sealers here, if they read at all, will read our own typography.

G. FOOD AND STORE SHOPPING OF THE NATIVES [Section 5].—Most of these articles of food mentioned heretofore are purchased by the natives in the company's store at either island; this food and the wearing apparel, crockery, etc., which the company bring up here for the use of the people, is sold to them at the exact cost price of the same, plus the expenses of transportation; and many times within my knowledge they have bought goods here, at these stores, at less rates than they would have been subjected to in San Francisco. The object of the company is not, under any circumstances, to make a single cent of profit out of the sale of these goods to the natives; they aim only to clear the cost and no more. Instructions to this effect are given to its agents, while those of the Government are called upon to take notice of the fact.

The store at St. Paul, as well as that at St. George, has its regular annual "opening" after the arrival of the steamer in the spring, to which the natives seem to pay absorbed attention; they crowd the buildings day and night, eagerly looking for all the novelties in food and apparel. These slouchy men and shawl-hooded women, who pack the area before the counters here, seem to feel as deep an interest in the process of shopping as the most enthusiastic votaries of that business do in our own streets; it certainly seems to give them the greatest satisfaction of their lives on the Pribilof Islands.

H. VIGILANCE OF THE NATIVES [Section 7].—One of the peculiarities of these people is that they seldom undress when they go to bed—neither the men, women, nor children; and also that at any and all hours of the night during the summer season, when I have passed in and out of the village to and from the rookeries, I always found several of the natives squatting before their house doors or leaning against the walls, stupidly staring out into the misty darkness of the fog or chatting one with the other over their pipes. A number of the inhabitants by this disposition are always up and around throughout the settlement during the entire night and day. In olden times, and even recently, these involuntary sentinels of the night have often startled the whole village by shouting at the top of their voices the pleasant and electric announcement of the "ship's light!" or have frozen it with superstitious horror in the recital at daybreak of ghostly visions.

I. HABITS OF FUR-SEAL PUPS [Section 9].—I have repeatedly watched young pups as they made advances to nurse from another pup's mother; the result invariably being that while the mother would permit her own offspring to suckle freely, yet when these little strangers touched her nipples she would either move abruptly away, or else turn quickly down upon her stomach, so that the maternal fountains were inaccessible to the alien and hungry "kotickie." I have witnessed so many examples of the females turning pups away, to suckle only some par-

ticular other one, that I feel sure I am entirely right in saying that the seal mothers know their own young; and that they will not permit any others to nurse save their own. I believe that this recognition of them is due chiefly to the mother's scent and hearing.

J. PARASITES OF THE FUR SEAL [Section 9].—The fur seal spends a great deal of time, both at sea and on land, in scratching its hide; for it is annoyed by a species of louse, a *pediculus*, to just about the same degree and in the same manner that our dogs are by fleas. To scratch, it sits upon its haunches and scrapes away with the toe nails of first one and then the other of its hind flippers; by which action it reaches readily all portions of its head, neck, chest, and shoulders; and, with either one or the other of its fore flippers, it rubs down its spinal region back of the shoulders to the tail. By that division of labor with its feet, it can promptly reduce, with every sign of comfort, any lousy irritation wheresoever on its body. This *pediculus* peculiar to the fur seal attaches itself almost exclusively to the pectoral regions; a few, also, are generally found at the bases of the auricular pavilions.

When the fur seal is engaged in this exercise, it cocks its head and wears exactly the same expression that our common house dog does while subjugating and eradicating fleas; the eyes are partly or wholly closed; the tongue lolls out; and the whole demeanor is one of quiet but intense satisfaction.

The fur seal appears also to scratch itself in the water with the same facility and unction so marked on land; only it varies the action by using its fore hands principally, in its fluvatile exercise, while its hind feet do most of the terrestrial scraping.

K. HEALTHINESS OF THE FUR SEALS [Section 9].—While I have written with much emphasis upon the total absence of any record as to the prevalence of an epidemic in these large rookeries, I should, perhaps, mark the fact that no symptoms of internal diseases have ever been noticed here, such as tuberculosis of the lungs, etc., which invariably attack and destroy the fur seal when it is taken into confinement, as well as the sea lions also; the latter, however, have a much greater power of endurance under such artificial circumstances of life. The thousands upon thousands of disemboweled Pribilof fur-seal carcasses have never presented abnormal or diseased viscera of any kind.

L. BEHAVIOR OF FUR SEALS AT NIGHT [Section 9].—I naturally enough, when beginning my investigation of these seal rookeries, expected to find the animals subdued at night or early morning on the breeding grounds; but a few consecutive nocturnal watches satisfied me that the family organization and noise was as active at one time as at another throughout the whole twenty-four hours. If, however, the day preceding had chanced to be abnormally warm, I never failed then to find the rookeries much more noisy and active during the night than they were by daylight. The seals, as a rule, come and go to and from the sea, fight, roar, and vocalize as much during midnight moments as they do at noonday times. An aged native endeavored to satisfy me that the "seecatchie" could see much better by twilight and night than by daylight. I am not prepared to prove to the contrary, but I think that the fact of his not being able to see so well himself at that hour of darkness was the true cause of most of his belief in the improved nocturnal vision of the seals.

As I write, this old Aleut, Phillip Vollkov, has passed to his final rest—"un konchielsah"—winter of 1878–79. He was one of the real characters of St. Paul. He was esteemed by the whites on account of his relative intelligence, and beloved by the natives, who called him

their "wise man," and who exulted in his piety. Phillip, like the other people there of his kind, was not much comfort to me when I asked questions as to the seals. He usually answered important inquiries by crossing himself and replying, "God knows." There was no appeal from this.

M. SULLENNESS OF OLD MALE SEALS [Section 10].—The old males, when grouped together by themselves, at the close of the breeding season, indulge in no humor or frolicsome festivities whatsoever. On the contrary, they treat each other with surly indifference. The mature females, however, do not appear to lose their good nature to anything like so marked a degree as do their lords and masters, for they will at all seasons of their presence on the islands be observed now and then to suddenly unbend from severe matronly gravity by coyly and amiably tickling and gently teasing one another as they rest in the harems, or later, when strolling in September. There is no sign given, however, by these seal mothers of desire or action in fondling or caressing their pups; nor do the young appear to sport with any others than the pups themselves when together. Sometimes a yearling and a five or six months old pup will have a long-continued game between themselves. They are decidedly clannish in this respect—creatures of caste, like Hindoos.

N. LEAPING OUT OF WATER: "DOLPHIN JUMPS" [Section 10].—As I never detected the sea lions or the hair seals leaping from the water around these islands in those peculiar dolphin-like jumps which I have hitherto described, I made a note of it early during my first season of observation, for corroboration in the next. It is so; neither the sea lion nor the hair seal here ever leaped from the ocean in this agile and singular fashion heretofore described. Allen, so conservative usually, seems, however, to have fallen into an error by reading the notes of Mr. J. H. Blake, descriptive of the sea lions of the Gallapagos Islands. As Allen quotes them entire in a footnote (page 211, History of North American Pinnipeds), I am warranted in calling attention to the fact that no authentic record has as yet been made of such peculiar swimming by *Phocidæ*, or the sea-lion branch of the *Otariidæ*. My notice has been called to this mistake by Professor Allen's own note (page 367) upon a quotation from my work citing Mr. Blake's notes above referred to, which are themselves very interesting, but do not even hint at a dolphin jump.

How fast the fur seal can swim when doing its best I am naturally unable to state. I do know that a squad of young "holluschickie" followed the *Reliance*, in which I was sailing, down from the latitude of the seal islands to Akootan Pass with perfect ease, playing around the vessel while she was logging straight ahead 14 knots to the hour.

The fur seal, the sea lion, the walrus, and the hair seal all swim around these islands and in these waters, submerged, extended horizontally, and squarely upon their stomachs. I make this note here because I am surprised to read (on page 651, Allen: Hist. N. A. Pinnipeds) that the harp (hair) seal's "favorite position when swimming, as affirmed by numerous observers, is on the back or side, in which position they also sleep in the water." Although this is a far distant, geographically speaking, relative of the hair seal of St. Paul Island, yet the remarkable difference in fashion of swimming seems hardly warranted, when the two animals are built exactly alike. Still, I have no disposition to question, earnestly, the truth of the statement, inasmuch as I have learned of so many very striking radical differences in habits of animals as closely related, as to pause ere seriously doubting this

assertion that a harp seal's favorite way in swimming is to lie upon its back when so doing. It is simply an odd contradiction to the method employed by the hair seals of the North Pacific and of Bering Sea.

While I am unable to prove that the fur seal possesses the power to swim to a very great depth, by actual tests instituted, yet I am free to say that it certainly can dive to the uttermost depths, where its food-fish are known to live in the ocean; it surely gives full and ample evidence of possessing the muscular power for that enterprise. In this connection, it is interesting to cite the testimony of Mr. F. Borthen, the proprietor of the Fro Islands, a group of small islets off Trondhjems fiörd, in Norway. This gentleman has had an opportunity of watching the gray seal (*Halichœrus grypus*) as it bred and rested on these rocks during an extended period of time. Among many interesting notes as to the biology of this large hair seal, he says, "As a proof that they (the seals) fetch their food from a considerable depth, it is related that a few years ago a young one was found caught by one of the hooks of a fishing line that was placed at a depth of between 70 and 80 fathoms, on the outer side of the islands. Gray seals have several times been seen to come up to the surface with lings (*Molva vulgaris*) and other deep-water fishes in their mouths, such fishes being seldom or never found at a less depth than between 60 and 70 fathoms." (Robert Collett, on the Gray Seal, Proc. Zool. Soc., London: Part II, 1881, p. 387.)

O. MONSTROSITIES AMONG THE SEALS.—Touching this question of monstrosities, I was led to examine a number of alleged examples presented to my attention by the natives, who took some interest, in their sluggish way, as to what I was doing here. They brought me an albino fur-seal pup, nothing else, and gravely assured me that they knew it owed its existence to the fecundation of a sea-lion cow by a fur-seal bull: "If not so, how could it get that color?" I was also confronted with a specimen—a full and finely grown 4-year-old *Callorhinus* which had, at some earlier day, lost its testicles either by fighting or accident while at sea; perhaps shaven off by the fangs of a saw-toothed shark, and also gravely asked to subscribe to the presence of a hermaphrodite!

Undoubtedly some abnormal birth shapes must make their appearance occasionally; but, at no time while I was there, searching keenly for any such manifestation of malformation on the rookeries, did I see a single example. The morphological symmetry of the fur seal is one of the most salient of its characteristics, viewed as it rallies here in such vast numbers; but the osteological differentiation and asymmetry of this animal is equally surprising.

P. THE DERIVATION OF THE NOMENCLATURE OF THE ROOKERIES. *The Reef rookery.*—"The Reef," so called on account of that dangerous line of submerged rocks, scarcely awash, which makes out to the southward from the point. The very first seals of the season usually land here every spring.

Zoltoi hauling grounds.—From "Zolotoi," or "golden," a Russian title given to the beach on account, perhaps, of its beauty, contrasted with the rough, rocky coasts elsewhere on the island. There is no trace of precious mineral in its composition, however, or even the glint of iron pyrites.

Gorbotch rookery.—"Gorbotch," or "humpback;" this name doubtless given it from the broken-backed outline to the west shore of the reef peninsula, on which the rookery is located.

Nah Speel rookery.—"Nah Speel," corrupted from "speetsah," or point. Why so distorted I have not satisfactorily learned from the

people. It arises from some localism, undoubtedly, pertinent long ago, but since forgotten.

Lukannon rookery.—"Lukannon;" so named after one of the Russian pioneers, a sailor, who is said to have taken from St. Paul Island in 1787 over 5,000 sea otters, aided by another promyshlenik, named Kaiekov. In the following year they only secured 1,000, and since then none have ever been taken from there to notice: while during the last forty years not one, even, has been seen.

Keetavie rookery.—"Keetavie," from "Keet," or Whale. When the whaling fleets were active in these waters, 1849–1856, a very large right whale, killed by some ship's crew, drifted ashore at the point here, and has thus given this name to it.

Tolstoi rookery.—"Tolstoi," or "thick." This is an indefinite name which the Russians use all over their geography of Alaska, just as we employ "Deer Creek" or "Muddy Fork" in our topographical nomenclature of the West. This point at St. Paul is, however, a thick and solid one; more so than any other headland there.

Zapadnie rookery.—"Zapadnie," or "westward." One of the few bear stories which the natives told me, in response to my queries as to the presence of polar "medvaidskie" in early times, is located between Boga Slov and Zapadnie Point. There are one or two rude basaltic caves on the slopes of this hill, into which the natives can squeeze themselves by great effort; here, they have declared to me that, as recently as 1848, a large polar bear lived and infested the island for some time. It was finally shot by a *posse comitatus* of the people, who were assisted by an English whale-boat's crew that, noticing the skurry on land, came ashore and joined in the hunt, armed with their lances. No record is made of bruin on the Pribilof since the death of this one. It undoubtedly was astray from St. Matthew Island, 200 miles to the northward. Prior to this event, the natives count several bear fights and routs—at wide intervals, however—since the occupation of the islands.

Polavina rookery.—"Polavina," or "halfway;" so named because the point and the old deserted village site contiguous was nearly halfway between Novastoshnah and the village. An officer of the Government, C. P. Fish, United States Signal Service, in 1874, started out to measure anew the height of Polavina Sopka; he strapped a barometer to his shoulders, and left the village early one July morning. The fog thickened up that noon rather more solidly than usual, and when he came down he missed the sealers' well-defined trail between Northeast Point and Lukannon, and brought up on the shore of that little round lake just southwest of the point. He actually passed the whole of the remaining daylight, six or seven hours, in walking around it, and declared that he would never have left this unconscious circular tramp had the fog, as is usual, not lifted just at late evening and given him better bearings. He never knew or suspected until then that he was walking in his own tracks. This is a true fog story.

Novastoshnah rookery.—"A place of recent growth;" so named from the fact that in early times—1787–1790—Hutchinsons Hill formed an island distinct and well defined from St. Paul. The people then used to go from Vesolia Mista over to Northeast Point in boats.

THE ST. GEORGE ROOKERIES.—There is nothing peculiar to the nomenclature of the St. George rookeries; they all bear English names around the village, while "Zapadnie" is named simply as it lies west therefrom, and "Starry Ateel" because it is near the site of an old settlement on the island.

FIRST ARRIVALS OF "HOLLUSCHICKIE" USUALLY APPEAR MAY 14–15.—The first "driving" for the season of the "holluschickie" seldom takes place sooner than the 12th or 15th of May; then only small numbers are secured, usually on the Reef Point at St. Paul, and at the Great Eastern rookery on St. George. They are driven thus early for food, though the skins are always carefully taken and accepted by the company. The sealing season opens lawfully by the 1st of June and closes on the 15th of August; but in practice it does not begin until the 12th–14th of June and ends by the 20th–25th of July.

ANNUAL CROAKING BY THE SEALERS.—I noticed in this connection a very queer similarity between the sealers on St. Paul and our farmers at home; they, just as the season opens, invariably prophesy a bad year for seals and a scant supply; then when the season closes they will gravely tell you that there never were so many seals on the island before! I was greeted in this manner by the agents of the company and the Government in 1872, again in 1873, and again in 1874. I did not get up to the grounds in 1876 soon enough to hear the usual spring croaking of disaster; but arrived, however, in time to hear the regular cry of "never was so many seals here before!"

FINAL NOTES AND TABLES RELATIVE TO THE VALUE, PROTECTION, AND GROWTH OF THE FUR SEAL, AND THE REVENUE DERIVED FROM THAT INDUSTRY ON THE PRIBILOF ISLANDS.

AN EXHIBIT OF VALUES GIVEN BY VENIAMINOV.—Pt. I: Zapieskie, etc., p. 83, showing the relative importance, commercially, of the land and marine furs taken from the Unalaska district (and sold) in 1833 by the Russian-American Company. (This district embraces the Pribilof Islands.)

Sort of fur.	Number of skins.	Price per skin per paper ruble.	Sum of value.	Reduced to our currency.	Remarks by the author, H. W. E.
Sea otters	100	450	45,000	$9,000	*Enhydra marina.*
Black foxes	300	150	45,000	9,000	*Vulpes fulvus* var. *argentatus.*
Cross foxes	600	25	15,000	3,000	*Vulpes fulvus* var. *decussatus.*
Red foxes	500	10	5,000	1,000	*Vulpes fulvus.*
Blue foxes	1,500	10	15,000	3,000	*Vulpes lagopus.*
Land otters	80	50	4,000	800	*Lutra canadensis.*
Fur seals	15,000	50	750,000	150,000	*Callorhinus ursinus.*
Walrus ivory	*100	80	8,000	1,600	A pood is 36$\frac{1}{6}$ pounds avoirdupois.
Whalebone	*200	40	8,000	1,600	The baleen from the right whale, *Balæna.*
Miscellaneous furs	.....	.....	1,000	200	Deer and sea-lion skins, odds and ends, etc.
Sum total	.....	.....	896,000	179,200	

* Poods.

The country (Alaska) is divided up into five districts: Sitka, Kadiak, Unalaska, Atka, and the North.

This whole country is under the control and government of the "Russian-American Company." * * * The business is conducted with a head, or a colonial governor, assisted by officers of the imperial navy (Russian) and those of the company's fleet, and other chiefs. In every one of the districts the company has an office, which is under the direction of an office chief (or agent), and he in turn has foremen (or "bidarsheeks").

The company on the island of St. Paul killed from 60,000 to 80,000 fur seals per annum, but in the last time (1833?), with all possible care

in getting them, they took only 12,000. On the island of St. George, instead of getting 40,000 or 35,000, only 1,300 were killed. * * * (Veniaminov: Zapieskie, etc., pt. i, chap. XII, 1840.)

The table and extracts which I quote above give me the only direct Russian testimony as to the value of the Pribilof fur-seal catch when the skins were in scant supply. It will be seen that they were worth then just $10 each.

I now append a brief but significant extract from Techmainov—significant simply because it demonstrates that all Russian testimony, other than Veniaminov's, is utterly self-contradictory in regard to the number of seals taken from the Pribilof Islands. Techmainov first gives a series of tables which he declares are a true transcript and exhibit of the skins sold out of Alaska by the Russian-American Company. The latest table presented, and up to the date of his writing, 1862, shows that 372,894 fur seal skins were taken from the Pribilof Islands, via Sitka, to the Russian markets of the world, in the years 1842–1862, inclusive; or giving an average catch of 18,644 per annum (p. 221.) Then, further on as he writes (nearly 100 pages), he stultifies his record above quoted by using the language and figures as follows:

"In earlier times more were taken than in the later; at present (1862) there are taken from the island of St. Paul 70,000 annually, without diminishing the number for future killing; on St. George, 6,000. * * * From 1842 to 1861 there were taken from the island of St. Paul 277,778 seal skins; blue foxes, 10,508; walrus teeth, 104 poods; from St. George 31,923 fur seals; blue foxes, 24,286." (P. Techmainov; Eestorecheskoi Obozeraiuia Obrazovania, Russian-American Company; pt. II, p. 310, 1863, St. Petersburg.) Further comment is unnecessary upon this author, who thus writes a "history of the doings of the Russian-American Company." Still, since Veniaminov's time, 1838–1840, it is the only prima facie testimony that we have touching these subjects while under Russian domination.

RUSSIAN GOVERNORS CONTROLLING THE PRIBILOF ISLANDS.—The following list gives the names of the several autocratic governors of the Russian-American Company who, in their order of mention, exercised absolute control over the Pribilof Islands between 1799 and 1867, inclusive: 1, Baranov; 2, Yahnovskie; 3, Moorayvev; 4, Chestyahkov; 5, Wrangell; 6, Kooprianov; 7, Etholine; 8, Tebenkov; 9, Rossenburg; 10, Viaviatskie; 11, Foragelm; 12, Maxsutov. Of the above, with the exception of Baranov, who was a self-made man, and General Viaviatskie, of the Russian army, all the others were admirals and captains in the Imperial navy of Russia.

FIRST EXEMPTION OF FEMALES IN DRIVING.—In the details of an old letter from a creole agent of the Russian-American Company on St. Paul in 1847, I find the following side reference to the number of skins which were shipped from the Pribilof Islands that season: [MS. letter of Kazean Shiesneekov, St. Paul Islands, 1847.]

5,606 "holluschickov" (young males).
1,894 "sairiee" (4 and 5 year old males); or a total of 7,497.

This is interesting, because it is the record of the first killing on the seal islands when the females were entirely exempted from slaughter.

THE SEAL ISLANDS WERE THE EXCHEQUER OF THE RUSSIAN-AMERICAN COMPANY: 1799–1825.—"The Russians, in their colonial possession under Baranov, made first the seal skin the basis of all transactions with foreigners by buying up whole cargoes of goods and

provisions brought into this country by English and American traders and paying for the same in this way. In other words, the seal islands were the exchequer where the Russian authorities could with certainty turn and lay their hands upon the necessary currency. These American, English, and other foreign sea captains, having disposed of their supplies at Sitka or Kadiak in this manner, took their fur-seal skins to China and disposed of them at a handsome advance for tea, rice, etc., in exchange. The profits made by these foreigners having reached the ears of the Russian home management of the fur company controlling Alaska, it was ordered then that payments in fur-seal skins for these foreign supplies should cease, and that the Russians themselves would ship their skins to China and enjoy the emolument thereof. The result of this action was that the Chinese market did not prove as valuable to them as it was to the foreigners; it became overstocked, and a general stagnation and depression of the seal business took place and continued until a change of base in this respect was again made, and the skins of the fur seal were shipped, together with the beaver, in bulk to the great Chinese depot of Kiachta, where the Russians exchanged these peltries for the desired supplies of tea, the trade thereof assuming such immense proportions that the record is made where in a single year the Russian Fur Company paid to their Government the enormous duty upon importations of tea alone of 2,000,000 silver rubles, or $1,500,000. This was the period in the history of the seal islands when, for a second time and within the writing of Veniaminov, the seal life thereon was well-nigh exterminated. The first decimation of these interests took place in the last decade of the eighteenth century, and shortly after the discovery of the islands, when, it is stated, 2,000,000 skins of these animals were rotting on the ground at one time. Rezanov applied the correction very promptly in the first instance of threatened extermination of these valuable interests, and when the second epoch of decimation occurred, in 1834 to 1836, Baron Wrangell, admirably seconded by Father Veniaminov, checked its consumption. These are instances of care and far-sightedness which are refreshing to contemplate." (Ivan Petrov: Rept. on Pop. and Resources of Alaska; Ex. Doc. No. 40, Forty-sixth Congress, third session, 1881.)

IRREGULARITY OF THE APPEARANCE OF PELAGIC FUR SEALS.—While investigating the subject of the actual numbers of fur seals secured at sea outside of the Pribilof Islands, I learned from Captain Lewis (Hudson Bay Company's *Otter*) that these animals never appear from season to season along the northwest coasts in the same general aggregate. For illustration, he cited the fact that in 1872 "immense numbers of fur-seal pups and yearlings" were observed in the ocean off Vancouver's Island and the entrance to Fuca Straits, "but last year (1873) very few of them again were seen." He thought that, in the case of the unwonted abundance of fur seals there during 1872, it was due to the fact "that these young seals must have lost their bearings somewhat in going north, and ran into the coast for a better point of departure." He declared also that fur seals had never, during his thirty years' service on the northwestern coast, been known to appear in such great numbers before, nor did any other Hudson Bay man know to the contrary. In 1872 he thought that "8,000 to 9,000 skins, chiefly pups and yearlings," would be a fair estimate for the entire quantity taken; for 1873 his figures showed only "600 or 700 skins; these were all older ones."

RECENT ERRONEOUS STATEMENTS IN REGARD TO PELAGIC BIRTH OF FUR SEALS.—Allen, in his History of North American Pinnipeds (pp. 772–773), quotes a writer who declares that any statement that the fur seal breeds alone on the Pribilof Islands to the exclusion of all other grounds on the northwest coast of America and Alaska is "preposterous, to his mind." This author claims to know, by his "own personal observation," that the fur seal does "have pups in open ocean off the entrance to Fuca Straits." On the contrary, I assert that it is a physical impossibility for the *Callorhinus* to bring forth its young alive in the water; the pup would sink like a stone instantly after birth, and the mother be wholly helpless to save it.

I should not heed this statement of Mr. Swan, reenforced by that of an old sailor, so gravely entered by Allen, were it not for his introduction on the following page (773) of an innocent announcement of fact by Prof. D. S. Jordan, who by it is unfortunately made to appear in the light of sustaining the idle theory of pelagic birth. Jordan's simple declaration that he had seen a "live fur-seal pup [June 1, 1880] at Cape Flattery, taken from an old seal just killed, showing that the time of bringing them forth was just at hand," is correct as far as it goes; but remember that this pup had been alive in its mother's womb for eleven months prior to the day Jordan saw it, and ten days or three weeks later, at the longest, this parent, if undisturbed, would have naturally brought it forth in the fullness of time on either St. Paul or St. George, of the Pribilof group. She could have made the journey there in six or seven days easily from Fuca Straits, if she had been pressed to do so by the expiration of her period of gestation.

Naturally enough, the careful naturalist, like Allen, no matter how able, will be deceived now and then in this manner, by untrustworthy statements made by those who are supposed to know by personal observation of what they affirm. Mr. Swan has passed nearly an average lifetime on the Northwest Coast, chiefly in the waters of Washington Territory, and has rendered to natural science and to ethnology efficient and valuable service by his labor in collecting, and his notes in regard to the Makah Indians of Cape Flattery; hence his erroneous statements above referred to (as to the fur seal) had a prima facie weight with Allen, who therefore inserted them, and thus gave the romance an appearance of reality which I can not pass by in silence. The other, though hesitating, authority, Charles Bryant, is an old mariner, who has also been well situated by virtue of eight years' residence on St. Paul Island; he ought to know better.

ORIGINAL SOURCE OF ERROR IN REGARD TO NUBILITY OF FEMALE FUR SEALS.—Veniaminov: Zapleskie, ob Oonalashkenskaho Otdayla: Veniaminov little dreamed, as he labored over his queer calculations in 1834, that the then depleted rookeries of the Pribilof Islands would have yielded, from 1868 to date, an annual average of more than three times 32,000 fur seal skins; which number he at that time deemed the maximum limit of their ultimate production, should his tabulated advice be carried out. Is it not exceedingly strange that he never thought, during all his cogitations over this problem, of the real vital principle—of letting the females entirely alone—of sparing them strictly? I think that the worthy Bishop would have done so had he passed more time on the rookeries himself. I can not find, however, who the Russian was that had the good judgment, first of all men, to inaugurate a perpetual "zapooska" of the females on the Pribilof Islands; it was done in 1847, for the first time, and has been rigidly

followed ever since, giving the full expansion in 1857 to that extraordinary increase and beneficial result which we observe thereon to-day. I have been much amused in reading (Allen: Hist. Pinnipeds, p. 383) the argument of an old sailor, who had been stationed for eight years on these islands in charge of the United States Treasury interests. He claims to feel well assured that the female seals, when two years old, never land on the islands during that season of their age; remaining out at sea, and not coming to the Pribilof rookeries until their third year of growth, thus bearing their first young when four years old. I mention the fact, because it is not an original error of the aged Treasury agent, but is evidently adopted from this account of Veniaminov, which was verbally translated and read to him in 1869, on St. Paul Island, by one of the ex-agents of the Russian company. The erroneous statement, however, is quoted in Allen, Pinnipeds (p. 383), with a grave preface by the author that it is the result of eight years' study of the subject on the islands. Unfortunately, Veniaminov himself did not spend even eight consecutive weeks on the seal grounds in question, and had he passed eight months there, investigating the matter, he would not—could not—have made this superficial blunder, in addition to his numerous other faulty announcements, etc., which the "Zapieskie" teems with, in regard to the seal life.

CAUSES WHICH OCCASION AND DEMAND THE PRESENCE OF A REVENUE-MARINE CUTTER IN ALASKAN WATERS.—There remains an unwritten page in the history of the action of the Government toward the protection of seal life on the Pribilof Islands, and it is eminently proper that it should be inscribed now, especially so since the author of this memoir was an eyewitness and an actor in the scene. When he first visited the seal islands, in 1872–73, he was compelled to take passage on the vessels of the company leasing the islands; compelled, because the Government at that time had no means of reaching the field of action except by the favor and the courtesy of the Alaska Commercial Company. This favor and this courtesy, as might be expected, was always promptly and generously proffered and has never been alluded to as even an obligation or service rendered the Treasury Department. But, nevertheless, the thought occurred to me at the time, and was strengthened into conviction by 1874, that this indifference to its own self-respect and failure to support properly the aims of its agents up there should end, and that the Treasury Department should detail one of its own vessels to visit, transport, and aid its officers on the Pribilof Islands, and also be an actual living evidence of power to execute the law protecting and conserving the same.

In this sequence do not misunderstand me; while the Alaska Commercial Company never entertained, and do not now entertain, the thought of refusing the favor asked by the Government in transporting its own Treasury officials to and from the seal islands, yet it would be a relief to that company if those agents aforesaid should be carried up and down upon the vessels of the Government—a relief solely on the ground that a carping criticism is always made upon their courtesy and kindness in this respect and a corresponding reflection thrown upon the Treasury agents, who are compelled to take this method of conveyance or else be absent from their field of duty, which the company does not propose to effect by barring them from its steamer, the aforesaid criticism notwithstanding.

Therefore, upon the occasion of my return from the field in question, October, 1874, I clearly recognized the immediate necessity of strength-

ening the arm of the Government in that region, because, in addition to the foregoing reason, the following still more urgent one existed and exists:

Early in 1873 it became well known on the Pacific Coast that the officers of the law on the seal islands had no means of enforcing the regulations protecting the seal life on the same or in the waters adjacent. Hence a number of small craft, fitted out at San Francisco and contiguous ports, which cleared for the Northwest Coast and the Aleutian islands on "fishing ventures;" but, in reality, these vessels proceeded directly to the waters and rocks adjacant to the seal islands, where, in plain sight of the villages on either islet, they shot the swimming seals with assumed indifference and great affectation of legality.

In order, therefore, that this plain violation of law and its disastrous consequence should be effectually punished and evaded, I published and personally urged in 1874–1877 the urgent need and great propriety of enabling the responsible agents of the Government on the Pribilof Islands to enforce the law as well physically as it could be done theoretically, and pointed clearly then to the advantage and effect which a revenue-marine cutter would have, employed for this purpose. By repeated and untiring appearance before the Committees on Appropriations in the House and the Senate, I finally secured the legal authority and the money for the object in view; and the late Captain Baily, in the *Richard Rush*, made the first cruise, in the season of 1877, that had been ordered and sustained by the Government toward the direct protection of the seal islands and its valuable property thereon since 1869.

The interesting Alaskan reports, which have arisen from the incidental cruisings of the *Rush* and the *Corwin*, United States Revenue Marine, owe their origin to the above chain of circumstances, and this service, so efficient and so valuable, will, I trust, be faithfully sustained by the Government in the future.

THE AUTHOR'S CLOSING PRESENTATION OF THE SUBJECT.—As I end this memoir, I am aware of one omission which should not be overlooked. It is the absence of a concise and condensed table, which shall exhibit at a glance the whole physical progress made by the fur seal from birth to advanced puberty. Therefore I submit the following presentation of that subject:

Table showing the relative growth, weight, etc., of the fur seals.

[Compiled from the field notes of the author, made upon the killing grounds of St. George and St. Paul.]

GROWTH (A FAIR AVERAGE EXAMPLE).	1 day old.	6 months old.	1 year old.	2 years old.	3 years old.	4 years old.	5 years old.
	Length.	*Length.*	*Length.*	*Length.*	*Length.*	*Length.*	*Length.*
Callorhinus ursinus (male)	12 to 13 in.	24 in.	38 in.	45 in.	52 in.	58 in.	65 in.
Callorhinus ursinus (female)	12 to 13 in.	24 in.	37 in.	42½ in.	48 in.	50 in.	Ceases.
GIRTH IMMEDIATELY BEHIND FORE FLIPPERS.	*Girth.*	*Girth.*	*Girth.*	*Girth.*	*Girth.*	*Girth.*	*Girth.*
Callorhinus ursinus (male)	9 to 10½ in.	25 in.	25 in.	30 in.	36 in.	42 in.	52 in.
Callorhinus ursinus (female)	9 to 10 in.	25 in.	25 in.	30 in.	34 in.	36 in.	37 in.
WEIGHT.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Callorhinus ursinus (male)	5 to 7½	39	40	58	87	135	200
Callorhinus ursinus (female)	5 to 7	39	39	56	60	62	75

Table showing the relative growth, weight, etc., of the fur seals—Continued.

GROWTH (A FAIR AVERAGE EXAMPLE).	6 years old.	7 years old.	8 years old.	Remarks.
	Length.	*Length.*	*Length.*	
Callorhinus ursinus (male)	72 in.	75 to 80 in.	Ceases.	Direct, from tip of nose to root of tail.
Callorhinus ursinus (female)	.....	.....	.....	Do.
GIRTH IMMEDIATELY BEHIND FORE FLIPPERS.				
	Girth.	*Girth.*	*Girth.*	
Callorhinus ursinus (male)	64 in.	70 to 80 in.	80 to 84 in.	8 year old citation; an estimate only.
Callorhinus ursinus (female)	Ceases.	.....	.....	
WEIGHT.				
	Pounds.	*Pounds.*	*Pounds.*	
Callorhinus ursinus (male)	280 to 350	400 to 500	500 to 600	7 and 8 year estimates are not based upon actual weights; an opinion merely.
Callorhinus ursinus (female)	Ceases.	.....	.....	

NOTE.—All male fur seals, from yearlings to puberty, are termed "bachelors" or "holluschickie," and all male fur seals, from the age of 5 years on, are termed ("virile") bulls or "seacatchie." All female fur seals, from 1 year and upward, are termed "cows" or "matkamie" ("mothers"). All the young, under yearlings, are termed "pups" or "kotickie" ("little cats").

In conclusion, I desire to state that, as to the relative ages of the male and female *Callorhinus*, I have hitherto, in referring to it, taken the general ground of estimation which is commonly accepted in rating the duration of mammalian life. Nevertheless, on this point especially, I feel that if the real facts of the comparative longevity of the two sexes could be positively ascertained the great discrepancy which the table above faithfully portrays and suggests would be so modified as to make the relative length of life for the female much greater, and that of the male correspondingly less.

In my discussion of the reproduction of these animals I clearly show that the male is physically qualified to procreate his race at the age of 4 years, but that he is not allowed to do so until he is 6 or 7. Also, that the female becomes a mother at the expiration of the third year of her life and the immediate opening of the fourth. So, really, viewed from the point of sheer physical ability, if undisturbed the male fur seal wears the "toga virilis" at the close of the third and beginning of the fourth year of his life, while the female comes out eager for fecundation and prospective maternity at the end of the second and the beginning of the third summer of her existence.

TABULATED EXHIBIT OF METHOD OF KILLING, AND SEASONS OF THE YEAR IN WHICH IT IS DONE, ON THE PRIBILOF ISLANDS.—In order that the reader may the more clearly understand the time of killing, the seasons in which it is done, and the relative selection of the different classes of seals for slaughter, food, etc., I take much satisfaction in being able to submit the following tabulation, which gives at a glance a succinct and comprehensive epitome of one entire sealing season and its work on the Pribilof Islands. This table is literally brought down to date, and the figures upon which it is based I have taken from the recent official report of Col. H. G. Otis, who is the Treasury agent in charge of the interests of the Government therein represented. I ought, also, in simple justice to the authority from whom I have taken these enumerations, to state that those specifications of fact are evidently compiled from his field notes with scrupulous attention, both in their original registration and also in their transcription. As I here

arrange them, they present a photograph of the entire disposition of 107,000 fur seals slain upon the seal islands during one whole year.

Table showing the number slain, the time of so doing, the character, and the disposition made of the fur seal on the Pribilof group for one year ending July 20, 1881.

Months; time of slaughter.	Number of fur seals killed for natives' food.					Holluschickie killed for their skins.					Grand sum total.	
	Holluschickie.	Pups.	Rejected skins.			Prime.	Second rate.	Rejected skins.			Skins accepted by Alaska Commercial Company.	Whole number of fur seals slain.
			Undersize.	Staggy.	Cut.			Undersize.	Cut.	Other reasons.		
ST. PAUL ISLAND.												
Balance left over from "1880 count"	.....	.....	.....	.....	.....	228	.....	.....	.....	.....	*a* 228	.....
July (20th to 31st), 1880	261	.....	5	233	13	.....	.....	.....	.....	.....	10	*b* 261
August, 1880	622	.....	.....	.....	.....	.....	.....	.....	.....	.....	371	*c* 622
September, 1880	661	.....	.....	661	.....	.....	.....	.....	.....	.....	.....	*d* 661
October, 1880	453	10	10	393	.....	.....	.....	.....	.....	.....	60	*e* 463
November, 1880	540	4,400	4,401	54	5	.....	.....	.....	.....	.....	480	*f* 4,940
December, 1880	1,248	3	14	.....	36	.....	.....	.....	.....	.....	1,201	*g* 1,251
January, 1881	1,058	.....	4	.....	13	.....	.....	.....	.....	.....	1,041	*g* 1,058
May, 1881	176	.....	5	.....	.....	.....	.....	.....	.....	.....	171	*h* 176
June, 1881	.....	.....	.....	.....	.....	34,836	294	11	16	3	35,130	*i* 35,160
July (1st to 20th), 1881	.....	.....	.....	.....	.....	40,969	339	14	23	.....	41,308	*i* 41,345
Total	5,019	4,413	4,439	1,341	67	76,033	633	25	39	3	80,000	85,937
ST. GEORGE ISLAND.												
Balance left over from "1880 count"	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	*j* 25	.....
July (20th to 31st), 1880	147	.....	.....	.....	.....	.....	.....	.....	.....	.....	147	*d* 147
August, 1880	277	.....	11	.....	.....	.....	.....	.....	.....	.....	266	*k* 277
September, 1880	122	.....	.....	64	.....	.....	.....	.....	.....	.....	58	*k* 122
October, 1880	63	500	500	62	.....	.....	.....	.....	.....	.....	1	*f* 563
November, 1880	10	795	795	.....	.....	.....	.....	.....	.....	.....	10	*f* 805
December, 1880	46	35	35	.....	.....	.....	.....	.....	.....	.....	46	*l* 81
May, 1881	87	.....	.....	.....	.....	.....	.....	.....	.....	.....	87	*m* 87
June, 1881	.....	.....	.....	.....	.....	8,133	.....	1	31	1	8,133	*i* 8,166
July (1st to 20th), 1881	.....	.....	.....	.....	.....	11,227	.....	.....	25	5	11,227	*i* 11,257
Total	752	1,330	1,341	126	.....	19,385	.....	1	56	6	20,000	21,505
Pribilof catch for 1880 (St. Paul and St. George islands): Grand total	5,771	5,743	5,780	1,467	67	95,418	633	26	95	9	100,000	107,442

a Generally a few skins left behind every season.
b Two-year-old males and a few yearlings, principally,
c Two and 3 year old males generally.
d Two-year-old males chiefly.
e Two and 3 year old males principally.
f Pups killed by express permission of the Secretary of the Treasury.
g Very fine skins; remaining latest on the island.
h Very fine skins; first arrivals, 2 and 3 year old males.
i Very fine skins; 2 and 3 year old males chiefly.
j A few skins always left behind—not properly cured.
k Two and 3 year old males usually.
l Two and 3 year old males; fine skins.
m Two and 3 year old males; first arrivals of the new sealing year.

EXPLANATORY COMMENTS UPON THE ABOVE TABLE.—It will be at once noticed that, in the result of this last season's work on the Pribilof Islands, as illustrated so clearly above, the Alaska Commercial Company has taken its full annual legal quota of 100,000 fur-seal skins therefrom. I call attention to it, because it is the first season in which the company has done so; it has never heretofore permitted more than 99,800, in round numbers, to be taken and charged to its account, preferring to always be a little within the mark, on account of the exceeding difficulty of reconciling the enumeration of the two sets of

Government officers when their counts are placed side by side. For instance, the list of the Treasury agent on the islands, when the skins are first shipped, is the official indorsement of the company's catch for the year; but when the ship reaches San Francisco, then these skins are all counted over anew by another staff of Government agents. Should the tally of the seal-island agent be defective, and show that it was so by the recount of the custom-house officers in San Francisco, then, did it run over 100,000 skins, the company would have an annoying and unpleasant explanation to make, while the resident Treasury agent would be charged with maladministration of his affairs. Therefore, as it has never happened before until this season of 1881 that the two counts at San Francisco and St. Paul have agreed to a unit, the company has given strict and imperative orders that no more than 99,800 or 99,850 skins shall be annually taken by its agents from the seal islands. Taking the full quota of this season of 1881 was contrary to its express direction.

It is an exceedingly difficult matter to count these skins, precisely to a dot, when they are rapidly hustled into the baidars and then tossed below the decks of the rolling, pitching ship which receives them; a rough sea may be running, a gale of wind howling through the rigging, and a thick fog shrouding all in its wet gloom. I believe, therefore, from my own full experience in this important matter, that it is a physical impossibility, at many seasons of shipment, to tally accurately every pelt as it enters the vessel's hold, when loaded off the islands here. The Treasury agent who comes within 100 to 150 skins, more or less, of the true 100,000, or in that ratio to the whole catch, as it may be, is doing all that he possibly can under the circumstances. Naturally, the custom-house tally is considered the most accurate, by reason of the great physical advantages attendant, and upon its certification the company pays the tax levied by law.

USELESS SLAUGHTER OF THE PUPS.—The observer will also notice that during the last season, viz, July 20, 1880, to July 20, 1881, as shadowed in the foregoing table, more than 7,000 seals were killed for food, the skins of which were simply wasted—never used and of that aggregate we find nearly 6,000, or about nine-tenths of the entire loss, to be "pups." At this point, and in this connection, I desire to enter my protest against the useless and wholly uncalled-for slaughter of these pups, which is annually permitted and inadvertently ordered, with the best of spirit, by the Secretary of the Treasury. It is a shiftless legacy of the old Russian company, which the present admirable conduct of business on the Pribilof Islands really renders superfluous and wasteful. It is simply catering to a gastronomic weakness of the Aleuts that should not be considered, inasmuch as the supply and the flesh of the 2 and 3 year old males is fully good enough; and most of the skins taken from such animals late in October and thereon to the end of the year will be accepted as prime by the company and counted in the regular annual quota for exportation. I have in this matter, however, been quite as much at fault as the Secretary himself; more so, because I have not hitherto directed attention to it. It escaped my mind in 1874, and I have not had occasion to recall it until the present writing.

THE SEASON OF 1881 A VERY CREDITABLE ONE.—The exhibit given above of the work performed in the height of the sealing season, June and July, is a better one, even, than any one which has passed prior to it under my supervision. In other words, the number of cut or

rejected skins is almost infinitesimal compared with the huge aggregate accepted; and, were it not for the wasted pup skins, this presentation of the field labor on the seal islands for 1881 would be a very clean and economic synopsis.[1]

The thought also occurred to me, when regarding this special point of the relative improvement in the method of killing and handling seals and pelts, that a very simple yet trustworthy notice as to the increase or diminution of the seal life would be served annually in the following manner: In 1872 I observed that the natives never had any difficulty in getting their full quota of "holluschickie" daily during the prime season of taking skins; again, in 1873, I saw that, if anything, the number of "holluschickie" required was easier to obtain than in 1872, prior; still again, throughout the killing season of 1874, the constant remark of all concerned at St. Paul was that the prime seals were never so abundant before; and, finally, in 1876, I heard, from these same parties interested, that it had been the most auspicious season throughout ever known to St. Paul Island.

Thus, it may naturally be inferred that this steady and rather increased supply of "holluschickie" from year to year means nothing unless it points to a relative annual augmentation of the seal life on the Pribilof Islands; and it really acts in this wise as a life barometer, that is sensibly affected by the heavier or lighter pressure of the rookeries operating upon it.

Hence the foregoing table, brought down as it is to date, shows that the chosen seals are in abundant supply; that the work was remarkably expeditious; that the natives scarcely wasted a skin by cutting on the killing grounds; and, all in all, it represents a highly creditable state of affairs, suggestive of the steady condition of prosperity and security which I unhesitatingly prophesied in 1873, after giving the matter much study and reflection.

A PRESENTATION OF THE REVENUE DERIVED FROM THE PRIBILOF ISLANDS.—The following transcript from the books of the Treasury Department shows the exact receipts which the public coffers have derived as revenues from the seal industry on the Pribilof Islands between the date of the act leasing them, July 1, 1870, up to August 20, 1881. I may say, without the least exaggeration, that these interests never yielded a tithe of this substantial aid and support to the Government of Russia, and they would not have returned a single cent, net, to the Treasury of the United States had they not been so wisely and promptly protected by the good sense of our Congress in 1870. They would have passed in a few short seasons beyond all knowledge of men, as far as their appearance on the great breeding rookeries of St. Paul and St. George was concerned.

[1]The report of Colonel Otis, special agent Treasury Department, in charge of the seal islands, for 1880, contains an interesting table, which covers a period of eleven years, viz, 1869–1880, inclusive; and it shows, first, the number of seal skins taken in each sealing season proper on St. Paul Island; second, the number of days expended in the work per annum; third, the number of sealers engaged; fourth, the average number of skins taken per day; and fifth, the average daily credit of skins taken for each man. The deduction which that gentleman makes from this suggestive and instructive codification is that the seals seem to sensibly increase from year to year, rather than to diminish in numbers.

Tax and rental paid into the Treasury of the United States by the Alaska Commercial Company—the lessees of the Pribiloff Islands—1870–1881.

[Tax on seal skins taken by the Alaska Commercial Company, per act of July 1, 1870.]

No. 422, 4th quarter, 1870	$86,167.00	
No. 376, 1st quarter, 1871	5,862.00	
No. 1215, 2d quarter, 1871	9,051.00	
		$101,080.00
No. 753, 4th quarter, 1871	159,545.63	
No. 1255, 2d quarter, 1872	102,807.00	
		262,352.63
No. 596, 4th quarter, 1872		252,181.12
No. 1466, 3d quarter, 1873	108,066.00	
No. 1467, 3d quarter, 1873	150,648.75	
No. 1001, 4th quarter, 1873	13,366.50	
		272,081.25
No. 1533, 3d quarter, 1874	261,822.75	
No. 1534, 3d quarter, 1874	672.00	
		262,494.75
No. 445, 3d quarter, 1875	10,106.25	
No. 1515, 3d quarter, 1875	147,598.50	
No. 433, 4th quarter, 1875	104,879.25	
		262,584.00
No. 1089, 3d quarter, 1876	172,063.50	
No. 433, 1st quarter, 1877	64,092.00	
		236,155.50
No. 1527, 3d quarter, 1877		198,255.75
No. 1659, 3d quarter, 1878	36,965.25	
No. 1660, 3d quarter, 1878	209,895.00	
No. 1581, 4th quarter, 1878	15,587.25	
		262,447.50
No. 1088, 3d quarter, 1879	223,125.00	
No. 1686, 4th quarter, 1879	39,275.25	
		262,400.25
3d quarter, 1880		262,500.00
1881		262,395.00
Total tax paid up to date, August 20, 1881		2,896,927.75
Plus the annual rental of $55,000, from 1871–1880, inclusive, plus $5,480.75 rental for short lease of 1870 = rental paid		555,480.75
Grand total of tax and rental		3,452,408.50

GLOSSARY.

DEFINITION OF TECHNICAL TERMS AND RUSSIAN NOMENCLATURE, USED BY THE AUTHOR IN THE PRECEDING MONOGRAPH.

AHLUCKEYAK (Aleutian).—A rough backbone.
ALEUT (Russian).—Name given to all native inhabitants of the Aleutian Islands.
ARRIE (Russian).—*Lomvia arra.* The guillemot, or murre; so named from the bird's harsh cry of "arra-arra."
BAILLIE BRÜSHKIE (Russian).—*Phaleris psittacula.* Parroquet auk; "white bosom."
BANYAH (Russian).—A steamy bath house.
BARBIE (Russian).—An elderly married woman.
BARRABKIE (Russian).—A hut.
BARRABARA (Russian).—A large hut, or "kozarmie."
BOOROON (Russian).—Surf.
BIDARRAH (Russian).—A large skin-covered boat, propelled with oars, or used with sails before the wind; carries from three to ten tons.
BIDARKA (Russian).—A small skin-covered canoe.
BIDARSHIK (Russian).—One who controls a baidar and its crew; a foreman.
BOBROVIA (Russian).—Otter island.
BOGA SLOV (Russian).—God's word.
BOORGA (Russian).—Gale that blows fiercely and is laden with snow; from "boor-yah," a storm or tempest.
BOLSHOI (Russian).—Big.
BUIK (Russian).—A working ox, or bull.

The gold coinage of Russia is seldom seen, even at home, and never has been used in Alaska; the form of its coinage is known to Russians as an "Impériale," and is equal to about $5 of our currency.

The word "ruble," according to Mr. S. N. Büynitskie, comes from the Russian "roobeet," or, to hew with a hatchet, because the practice of notching the bullion bars, as specified below, was one that called for the use of a little ax for that purpose. In 1654 rubles were first introduced to Russia, at Moscow, in the form of bullion bars, with deep notches in them, "rubli," which enabled the possessor to detach as much of the bar as his payment might require; hence the origin of the word ruble. The first silver money of Russia was coined at Novogorod in 1420. It was struck in small pieces, which were then, as now, called "kopecks." The present value of the kopeck is not quite three-fourths of 1 cent (United States currency). Nearly all the ordinary business calculations of Russia are made upon the basis of kopecks. At present specie has substantially disappeared in that country, and depreciated paper is the representative. The silver kopeck no longer exists as current coin. The copper kopeck bears on its obverse side the figure of St. George spearing a dragon. "From this spear," says Georgi, "called kapæa in Russia, the term kopeck has been derived."

A still smaller coin, called the "polooshka," worth one-fourth kopeck, has been used in Russia. It takes its name from a hare skin, "ooshka," or "little ears," which, before the use of money by the Sclavs, was one of the lowest articles of exchange, pol signifying half, and polooshka half a hare's skin. From another small coin, the "deinga" (equal to one-half kopeck in value), is derived the Russian word for money, deingah or deingie.[1]

In conclusion, it may be interesting to add to this mention of the coin used on the seal islands and in the fur-trade transactions of Alaska that the first piece of stamped money known to the numismatic records is a small coin made by the Phocians about 700 B. C., on the obverse side of which was the figure of a seal, so stamped because when these people were emigrating, their boats were "followed by shoals of seals."

EXPLANATORY NOTES AND COMMENTS UPON THE MAP OF ST. PAUL ISLAND.

ST. PAUL.—This name was given to the island because it was descried for the first time on St. Paul's Day, July 10, 1787, by the Russian discoverers. [June 29, Justinian calendar.]

DEFINITIONS FOR RUSSIAN NAMES OF THE ROOKERIES, ETC.—The several titles on the map that indicate the several breeding grounds owe their origin and have their meaning as follows:

Zapadnie signifies "westward," and is so used by the people who live in the village.

Zoltoi signifies "golden;" so used to express the metallic shimmering of the sands there.

Ketavie signifies "of a whale;" so used to designate that point where a large right whale was stranded in 1849 (?); from Russian "keet," or "whale."

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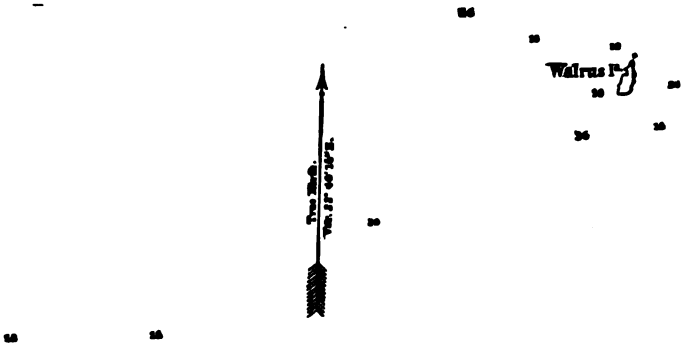
[1]As far as I can ascertain, the above expression of Russian nomenclature regarding the subjects named is the first correct rendition made in the English language of the same. Clarke [Travels: 1800] gives, on a fly-leaf of introduction to his interesting and graphic picture of Russian life and country, these items of weight, measure, and money, nearly all correct as to figures, but hardly one of the Muscovitic equivalents is properly pronounced and spelled in accordance. He frankly confesses his ignorance, however, of the Russian language, and hence bars out all adverse criticism thereby. I should also add that I have, as far as possible, refrained from using any of the Aleutian nomenclature on the seal islands, for the simple reason that while those natives do not, in talking among themselves, employ the above Russian titles, yet when they address us they do, and hence the Slavonian designations are those which all races up there agree upon in their definition and application.



St PAUL,

Prybilov Group, Bering Sea, Alaska.

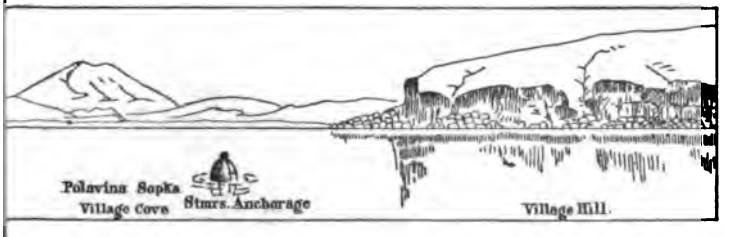
Surveyed and drawn April, 1873—July, 1874.

by

HENRY W. ELLIOTT

1 2 3 4

Scale:—Statute Miles.



area of St Paul 33 sq m 42 m shore line *(16½ of which Seal Ground.)*

Reef Point	57° 08′ 00″ N.	Lat.	170° 12′ 00″ W.	Long.
S. W.	57° 11′ 12″ N	Lat.	170° 19′ 03″ W.	Long
N E	57° 16′ 04″ N.	Lat.	170° 00′ 02″ W	Long.
Otter I.	57° 03′ 00″ N.	Lat.	170° 16′ 00″ W	Long.
Walrus I	57° 11′ 05″ N	Lat.	169° 49′ 06″ W	Long.

Soundings by Capt. J. G. BAKER, U. S. Revenue Marine, in fathoms.

Lukannon.—So named after one Lukannon, a pioneer Russian, who distinguished himself, with one Kaiecov, a countryman, by capturing a large number of sea otters at that point, and on Otter Island, in 1787–88.

Tonkie mees signifies "small (or slender) cape" [tonkie, "thin;" mees, "cape"].

Polavina literally signifies "halfway;" so used by the natives because it is practically halfway between the salt houses at Northeast Point and the village. Polavina Sopka, or "halfway mountain," gets its name in the same manner.

Novastoshnah, from the Russian "novaite," or "of recent growth;" so used because this locality in pioneer days was an island to itself, and it has been annexed recently to the mainland of St. Paul.

Vesolia mista, or "jolly place," the site of one of the first settlements, and where much carousing was indulged.

Maroonitch, the site of a pioneer village, established by one Maroon.

Nahsayvernia, or "on the north shore;" from Russian "sayvernie."

Boga Slov, or "word of God;" indefinite in its application to the place, but is, perhaps, due to the fact that the pious Russians, immediately after landing at Zapadnie, in 1787, ascended the hill and erected a huge cross thereon.

Einahnuhto, an Aleutian word, signifying the "three mammæ."

Tolstoi, a Russian name, signifying "thick;" it is given to at least a hundred different capes and headlands throughout Alaska, being applied as indiscriminately as we do the term "Bear Creek" to little streams in the Western States and Territories.

THE PROFILE OF ST. PAUL.—That profile of the south shore, between the Village Hill and Southwest Point, taken from the steamer's anchorage off the Village Cove, shows the characteristic and remarkable alternation of rookery slope and low sea-level flats. This point of viewing is slightly more than half a mile true west of the Village Hill, to a sight which brings Boga Slov summits and Tolstoi head nearly in line. At Zapadnie is the place where the Russian discoverers first landed in 1787, July 10. With the exception of the bluffy west end, Ein-ahnuh-to cliffs, the whole coast of St. Paul is accessible, and affords an easy landing, except at the short reach of "Seethah" and the rookery points, as indicated. The great sand beach of this island extends from Lukannon to Polavina, thence to Webster's house, Novastoshnah; from there over, and sweeping back and along the north shore to Nahsayvernia headland, then between Zapadnie and Tolstoi, together with the beautiful though short sand of Zoltoi. This extensive and slightly broken sandy coast is not described as peculiar to any other island in Alaska, or of Siberian waters.

FRESH-WATER LAKES.—There are no running streams at any season of the year on St. Paul, but the abundance of fresh water is plainly presented by the numerous lakes, all of which are "svayjoi" save the lagoon estuary. The four large reefs which I have located are each awash in every storm that blows from seaward over them. They are all rough, rocky ledges. That little one indicated in English Bay caused the wrecking of a large British vessel in 1847 which was coming in to anchor just without Zapadnie. A number of the crew were "maaslucken,"[1] so my native informant averred.

DRIFTWOOD.—Most of the small amount of driftwood that is found on this island is procured at Northeast Point and Polavina; the north shore from Maroonitch to Tsammanah has also been favored with sea-waif logs in exceptional seasons to the exclusion of all other sections of the coast. The natives say that the St. George people get much more driftwood every year, as a rule, than they do on St. Paul. From what I could see during my four seasons of inspection they never have got much, under the best of circumstances, on either island. They pay little attention to it now and gather what they do during the winter season, going to Polavina and the north shore with sleds, on which they hoist sails after loading there and scud home before the strong northerly blasts.

Captain Erskine informs me that the water is free and bold all around the north shore from Cross Hill to Southwest Point—no reefs or shoals up to within a half a mile of land anywhere. English Bay is very shallow, and no seagoing vessel should attempt to enter it that draws over 6 feet.

AUTHORITIES FOR LATITUDE AND LONGITUDE.—All the positions of latitude and longitude which I place upon this map are taken from Captain Archimandritov's manuscript chart. During the whole month of July, 1874, while I was here with the *Reliance*, there was not a single opportunity for a solar observation, although Captain Baker made several attempts to make some. Captain Erskine, however, has verified Archimandritov's work, and says that it is very near the correct thing. I could have taken observations easily in the occasional clear November days of 1872, but, unfortunately, the chronometer which I had proved so defective that I abandoned the labor.

HOW TO REACH WALRUS ISLET.—To visit Walrus Island in a boat, pleasantly and

[1] Anything missing, or beyond human ken, in the Aleutian vernacular is "maaslucken."

successfully, it is best to submit to the advice and direction of the natives. They leave the village in the evening and, taking advantage of the tide, proceed along the coast as far as the bluffs of Polavina, where they rest on their oars, doze and smoke, until the dawning of daylight, or later, perhaps, until the fog lifts enough for them to get a glimpse of the islet which they seek; they row over then in about two hours with their bidarrah. They leave, however, with perfect indifference as to daylight or fog. Nothing but a southeaster can disturb their tranquillity when they succeed in landing on Walrus Island. They would find it as difficult to miss striking the extended reach of St. Paul on their return as they found it well-nigh impossible to push off from Polavina and find "Morzovia" in a thick, windy fog and running sea.

OTTER ISLET: SLIGHT CORRECTION.—Otter Island, or "Bobrovia," is easily reached in almost any weather that is not very stormy, for it looms up high above the water. It takes the bidarrah about two hours to row over from the village, while I have gone across once in a whaleboat with less than one hour's expenditure of time, sail and oars, en route. A slight mistake of the engraver causes Crater Point to appear as a bifurcated tongue. It is not so; but there is a funnel-shaped cavity here plainly emarginated from the sea, and on that extreme point, constituting and giving to it this name.

EXPLANATORY NOTES AND COMMENTS UPON THE MAP OF ST. GEORGE ISLAND.

ST. GEORGE.—This title was given to the island by its discoverer in honor of his vessel, the sloop *St. George*.

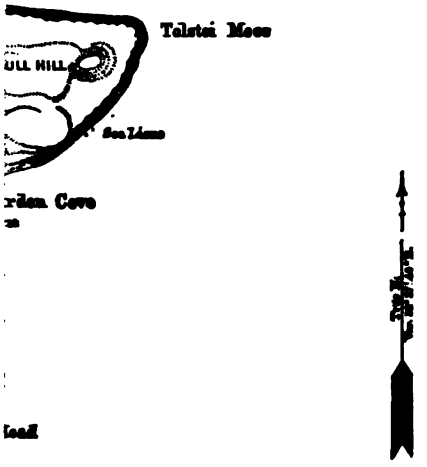
SALIENT FEATURES OF THE TOPOGRAPHY: INACCESSIBLE CHARACTER OF THE COAST.—The profile which I give of this island presents clearly the idea of that characteristic, bold, abrupt elevation of St. George from the sea. From the Garden Cove around to Zapadnie Beach there is not a single natural opportunity for a man to land; then, again, from Zapadnie Beach round to Starry Ateel there is not one sign of a chance for an agile man to come ashore and reach the plateau above. From Starry Ateel to the Great Eastern rookery there is an alternation between the several breeding grounds of three low and gradual slopes of the land to sea level; these, with the landing at Garden Cove and at Zapadnie, are the only spots of the St. George coast where we can come ashore. An active person can scramble up at several steep places between the sea-lion rookery and Tolstoi Mees, but the rest of that extended, bluffy sea wall, which I have just defined, is wholly inaccessible from the water. A narrow strip of rough, rocky shingle, washed over by every storm-beaten sea, is all that lies beneath the mural precipices.

PRETTY CASCADE AT WATERFALL HEAD.—In the spring, when the snow melts on the high plateau, a beautiful cascade is seen at Waterfall Head. The feathery, filmy, silver ribbon of plunging water is thrown out into exquisite relief by the rich background of that brownish basalt and tufa over which it drops. Another pretty little waterfall is to be seen just west of the village at this season only, where it leaps from a low range of bluffs to the sea. The first-named cascade is more than 400 feet in sheer unbroken precipitation.

One or two small, naked, pinnacle rocks, standing close in and almost joined to the beach at the sea-lion rookery, constitute the only outlying islets or rocks; a stony kelp bed at Zapadnie and one off the Little Eastern rookery, both of limited reach seaward, are the only hindrances to a ship's sailing boldly round the island, even to scraping the bluffs, at places, safely with her yardarms. I have located the Zapadnie Shoal by observation from the bluffs above, while Captain Baker, of the *Reliance*, sounded out the other.

AUTHORITIES FOR LATITUDE AND LONGITUDE.—The observations which fix the positions of Tolstoi and Dalnoi Mees are taken from Russian authority (Captain Archimandritov), while the location of the village was made by Lieut. Washburn Maynard and myself in 1874, together with the degrees of variation to the compass. We used an artificial horizon. The overcast weather prevented our verification of the two other points given.

TREND OF OCEAN CURRENTS HERE.—Although small quantities of driftwood lodge on all points of the coast, yet the greatest amount is found on the south shore and thence around to Garden Cove. This drift timber is usually wholly stripped of its bark, principally pine and fir sticks, some of them quite large, 18 inches to 2 feet in diameter. Several years occur when a large driftage will be thrown or stranded here; then long intervals of many seasons will elapse with scarcely a log or stick coming ashore. I found at Garden Cove, in June, 1873, the well-preserved husk of a cocoanut, cast up by the surf on the beach. Did I not know that it was most



ST GEORGE,

Prybilov Group, Bering Sea, Alaska.

Surveyed and drawn April, 1873—July, 1874.

by

HENRY W. ELLIOTT.

Scale:—Statute Miles.

Tolstoi Mees; 56° 37′ 01″ N. Lat. 169° 27′ W. Long.
Dalnci Mees; 56° 39′ 03″ N. Lat. 169° 44′ W. Long.
Village; 56° 39′ 16″ N Lat 169° 19′ W. Long.

Water deep and bold all around Island, 16 to 20 fathoms

undoubtedly thrown over by some whaler in these waters, not many hundred miles away at the farthest, I should have indulged in a pretty reverie over its path in drifting from the south seas to this lonely islet. I presume, however, that the timber which the sea brings to the Pribilof Islands is that borne down upon the annual floods of the Kuskokwim and Nushagak rivers, on the mainland and to the east-northeastward, a little more than 225 miles. It comes, however, in very scant supply. I saw very little driftwood on St. Matthew Island, but on the eastern shore of St. Lawrence there was an immense aggregate, which unquestionably came from the Yukon mouth.

SPOT OF PRIBILOF'S LANDING.—One of the natives, "stareek," Zachar Oostigov ("the president"), told me that the "Russians, when they first landed, came ashore in a thick fog" at Tolstoi Mees, near the present sea-lion rookery site. As the water is deep and bold there, Pribilof's sloop, the *St. George*, must have fairly jammed her bowsprit against those lofty cliffs ere the patient crew had intimation of their position. The old Aleut then showed me the steep gully there, up which the ardent discoverers climbed to the plateau above; and to demonstrate that he was not chilled or weakened by age, he nimbly scrambled down to the surf below, some 350 vertical feet, and I followed, half stepping and half sliding over Pribilof's path of glad discovery and proud possession, trodden by him one June day nearly a hundred years ago.

SUGGESTIONS FOR BETTER LOADING AND DISCHARGING A CARGO.—With regard to the loading and unloading of the vessels at St. George, I believe that it would be wise and economical to grade a wagon road over from the village to Garden Cove. I think so because weeks and weeks consecutively have passed to my personal knowledge between the unloading and the loading of the steamer, when, during all that season of weary, anxious waiting for the surf to quiet down at the village landing, there was not a single day in which the ship could not have discharged or received her cargo easily and expeditiously on the sand beach at Garden Cove. When the *St. Paul* has 75,000 seal skins in her hold, taken on at the larger island, she then has to pound "off and on" here in fog and tempest for a week or two, or even longer, waiting for a chance to get the 20,000 or 25,000 St. George skins (ready for her) in turn. Her cargo is too costly to risk in this manner, inasmuch as the difficulty can be readily obviated by the cart road I have indicated. The natives could and would hitch themselves into large handcarts, and thus draw the skins across and supplies back, with the aid of a mule or two on the stiff grade. This would occur in ascending Ahluckeyak ridge from the village, and also up a short one again rising from Garden Cove to the mesa tops. The distance is only 2¾ to 3¼ miles, and 2 miles of that is nearly fit for wheels as it lies to-day. I think, seriously, this should be done; it may save or prevent in the future the loss of a valuable ship and her priceless cargo of human life and all its belongings. Thick fogs and howling gales of wind are dangerous and chronic here.

WHAT THE SKETCH MAP SHOWS.—The sketch map of Alaska which I have inserted in the lower corner of this chart of St. George is to show, better than any language can, the relative position of these celebrated seal islands; and also to give a clear idea of their isolation and great distance from Sitka, where most of our people think all Alaska is centered. In fact, Sitka, as far as trade and resources and population are concerned, is one of the most insignificant spots known to that country. Kadiak, Unga, Belcovskie, and Unalaska each have a greater civilized population than has Sitka to-day and each has a hundredfold more importance as a trade center. As the ship sails, the Pribilof Islands are: 2,250 miles WNW. from San Francisco; 1,500 miles WNW. from Vancouver Island, Straits of Fuca; 1,400 miles WNW. from Sitka; 550 miles SWNW. from Kadiak; 192 miles NNW. from Unalaska; and 700 miles ENE. from Commander Islands, Russian territory. All these distances are via Unalaska save the last one.

REPORT

ON THE

FUR-SEAL FISHERIES.

BY

LIEUT. WASHBURN MAYNARD, U. S. N.

THE FUR-SEAL FISHERIES.[1]

By LIEUT. WASHBURN MAYNARD, U. S. N.

NEWPORT, R. I., *November 30, 1874.*

SIR: In obedience to your instructions of the 9th of May, assigning me to the duty required by an act of Congress approved April 22, 1874, entitled "An act to enable the Secretary of the Treasury to gather authentic information as to the condition of the fur trade in the Territory of Alaska," I have been engaged, as far as has been practicable this season, in making the necessary investigation. My attention has been given chiefly to the fur-seal fisheries, as being the largest and most important branch of the fur trade, and especially to ascertaining whether the terms of the lease from the United States to the company now in possession of them have been complied with by said company. I have also had opportunity to acquire information in regard to the sea-otter trade, and to make an examination of the islands of St. Matthew and St. Lawrence, two large islands in Bering Sea, north of the Pribilof group.

I have now the honor to submit, for your consideration, the following report in relation to those subjects.

I am, sir, very respectfully, your obedient servant,

WASHBURN MAYNARD,
Lieutenant, United States Navy.

Hon. GEORGE M. ROBESON,
Secretary of the Navy,
Navy Department, Washington, D. C.

THE FUR-SEAL FISHERIES.

The islands of St. Paul and St. George, or the "seal islands," as they are commonly called, are the principal ones of the Pribilof group; the other two, known as the Otter and Walrus islands, being merely islets. They lie in Bering Sea, between 56° and 58° of north latitude and 169° and 171° of west longitude. The former has an area of 33 and the latter of 27 square miles, with, respectively, 42 and 29 miles of shore line. They are enveloped in summer by dense fogs, through which the sun rarely makes its way, and are surrounded in winter by fields of ice driven down from the Arctic by northerly gales. They have no sheltered harbors, but slight indentations in the shore line afford a lee for vessels and a tolerable landing place for boats in certain winds.

[1] Published as House Ex. Doc. No. 43, Forty-fourth Congress, first session.

The shores are bold and rocky, with strips of sand beach and slopes covered with broken rocks at intervals between the cliffs, and the interior of both is broken and hilly; neither tree nor shrub grows upon them, but they are covered with grass, moss, and wild flowers. For nearly one hundred years fur seals have been known to visit them annually in great numbers for the purpose of bringing forth and rearing their young, which circumstance gives them no inconsiderable commercial importance. The seals occupy the island from the breaking away of the ice in the spring until it surrounds them again in early winter; that is, from about the middle of May until December. In mild winters, when there is little or no ice about the islands, a few seals have been seen swimming about in the water through the entire season, but it has rarely occurred. They are not known to haul up on the land elsewhere within the limits of the North Pacific Ocean except upon Bering and Copper Islands, lying in Bering Sea, near the Asiatic Coast and Robin Reef, a small rock in the Okhotsk Sea. They certainly go to the southward in the fall, for they are frequently seen at sea, either singly or in schools of several thousands, and are killed in the water all the way from Sitka to the Straits of Fuca. In 1825, 54 were taken by the Russians on the Farallones Islands, off the entrance to the Bay of San Francisco, but none before or since have been seen there. There seems to be no reason why they can not remain in the water during the entire time they are absent from the islands, for they eat their food there at all times, and are able to sleep upon its surface.

They may be divided into two classes, the breeding and the nonbreeding seals. The former comprise the full-grown males or bulls, the adult females or cows, and the young, or pups; the latter, the young or bachelor males, and the yearlings of both sexes. Both classes leave the water and haul up along the shores of the islands near, but entirely separate from each other. They choose certain portions of the shore, to the exclusion of the rest, not all of either class being together, but each into separate communities, which are often several miles apart. The breeding seals occupy the sloping ground between the cliffs, which is covered with bowlders and broken rocks, beginning a few feet above high-water mark and extending back to the depth of from 50 to 200 feet in a compact, uniform manner. Such spaces are called breeding rookeries. The nonbreeding seals, on the contrary, are scattered over the sand beaches and the higher ground in rear of the rookeries, without any regular order of distribution. The parts of the shore so used are called "hauling grounds." Pathways are left open in the rookeries at convenient points to allow the passage of the nonbreeding seals to and from their hauling grounds in the rear.

There are 11 rookeries on St. Paul Island, extending, with the adjacent hauling grounds, over more than one-third of its shore line, and on St. George Island 5, taking up less than one-tenth of it. They are reoccupied each year with but little change.

About the middle of May the bulls, which are the first of the breeding seals to arrive, haul from the water and establish the rookeries in readiness for the cows, who begin to come a little later. It seems probable that the rookeries are occupied by the same bulls and cows from year to year, as they change but little either in size or form; but it has been proved that the bachelors do not return to the same hauling ground, or even to the same island. The time of arrival of the cows is governed by their period of gestation, as they do not appear on the rookeries until within a short time of giving birth to their pups; hence all do not come at the same time, but continuously from the latter part of May until the

middle of July. The bulls are polygamous, having from 5 to 20 cows each; so the number of them upon the rookeries is not more than one-tenth that of the cows. They have frequent and bloody fights for the possession and retention of their places upon the rookeries and of the cows, in which some are killed, others driven from the rookeries, and all more or less badly bitten and gashed by the sharp, curved tusks of their opponents. The cows, even, do not always escape unhurt, as two bulls sometimes seize a cow and literally tear her in two in their struggle for possession.

The cows are continually arriving upon the rookeries and giving birth to their pups until about the middle of July. Usually each cow bears a single pup, though I have been told by persons whose statement I have no reason to doubt, that they have witnessed one or two instances of twins. From the 10th to the 25th of July the rookeries are fuller than at any other time during the season, as the pups have all been born, and all the bulls, cows, and pups remain within their limits.

During the breeding season, nearly three months, the bulls have remained upon the rookeries, never leaving them for an instant, even to procure food.

This fasting, the constant watchfulness necessary to keep their harems together and to prevent the encroachments of other bulls, and the service of the cows, render their position no sinecure. Their emaciated bodies and loose and wrinkled skins at its close are in marked contrast to the fat, sleek-looking cows, for the latter have been constantly going and coming between the rookeries and the water, so that at any one time there are seldom more than one-half of them on shore. About the first of August, the breeding season being over, and the pups, which grow rapidly, having become large and strong enough to move about, the rookeries begin to lose their compact formation and rigid exclusiveness. The bulls begin to go into the water, their places being filled by the younger males, which up to this time have not been allowed to go upon the rookeries, while the cows and pups spread back over the hauling grounds in scattered groups, and occupy more than twice the space that had previously held them. Meanwhile the young males or bachelor seals have been coming to the hauling grounds, which are covered more or less thickly with them all summer. They do not remain on shore long at a time, but haul up to sleep and play for a while, and then return to the water for food. They are so numerous, however, that thousands can always be seen upon the hauling grounds, as all of them are never either on shore or in the water at the same time. The yearlings, easily distinguished by their size and the silvery color of their sides and bellies, do not make their appearance until the latter part of July, when they arrive in a body, males and females, together. They go upon the hauling grounds in great numbers, and play together for hours at a time. The bachelors join them in their sport, and, singling out the baby cows, form mimic rookeries, and imitate the roaring, fighting, and caressing of the bulls in a ludicrous manner. In September and October the pups exchange the coat of short black hair, which had been their only covering from their birth, for one of fur, and hair similar in appearance to that of the yearling, and learn to swim, in readiness for their departure from the island in November and December. Many of them are killed by the surf, particularly if the season is a stormy one, as they are not strong enough swimmers to save themselves from being dashed against the rocks by it. The cows remain with their pups, and suckle them until all have left the islands in December. It is probable that of the seals born each

year about one-half are males. The experiment was tried of examining one hundred pups taken at random from the rookeries, and in that number the sexes were about equally divided. The number of bachelor seals in proportion to the cows would also seem to confirm the supposition. There is not the slightest perceptible difference in appearance between seals of the two sexes, either in the first or second year after their birth, but as they grow older they differ, so as to be readily distinguishable from each other. The pups when born have only a short black hair, no fur; this is gradually replaced in their first year by a coat of fine, thick fur of a light gray color, and of hair longer than the fur, so as to cover it, of a silvery gray upon their sides and bellies, but black or very dark gray upon their backs. The color of their hair changes, in their second year, to a uniform dark gray. In their fifth year the hair upon the neck and shoulders of the males begins to grow coarser and longer, forming a sort of mane, which increases in length and stiffness until he has attained his full growth, in his eighth or ninth year. The females are not found upon the hauling grounds with the males after they are two years old; hence it seems probable that they go upon the rookeries in their third, and bear a pup in their fourth year. When both are full grown, the sexes differ most widely in appearance. The male, weighing from four to five hundred pounds, is about three times as large as the female, has a mane, and is either black or dark brown in color. The color of the female is a soft rich brown upon the back and sides, changing almost to orange upon the belly, and she has no mane. The fur of the cows is rather thicker and finer than that of the other seals, though the skins of young males from three to six years old are not very much inferior.

It is of great importance to know how many seals come annually to the island, or rather to know how many may be killed for their skins without causing a less number to come hereafter than do at the present time. To determine how many there are with accuracy is a task almost on a par with that of numbering the stars. The incessant motion of the animals when on shore, the great variety in size, color, and position, the extent of surface over which they are spread, and the fact that it can not be determined what proportions of them are on shore at any given time, make it simply impossible to get more than an approximation to their numbers. They have been variously estimated at from one to fifteen millions. I think the most accurate numeration yet made is that by Mr. H. W. Elliott, special agent of the Treasury Department, in 1872. This calculation is based upon the hypothesis that the breeding seals are governed in hauling by a common and invariable law of distribution, which is, that the area of rookery is directly proportional to the number of seals occupying it. He estimates that there is one seal to every two square feet of rookery surface; hence the problem is reduced to the simple operation of obtaining half the sum of the superficial areas of all the rookeries in square feet. He surveyed the rookeries of both islands in 1872, when at their greatest limit of expansion, and obtained the following results: Upon St. Paul Island there were 6,060,000 square feet of ground, occupied by 3,030,000, and on St. George Island 326,840 square feet, occupied by 163,420; a total for both islands of 3,193,420 breeding seals. The number of nonbreeding seals can not be determined in the foregoing manner, as they haul most irregularly; but it seems probable that they are nearly as numerous as the other class, which would give not far from 6,000,000 as the number of seals of all kinds which visited the island during the season of 1872.

It is likely that these figures are not far from the truth, but I do not

think it necessary to take into consideration the actual number of seals in order to decide the question of how many can be taken each year without injury to the fisheries. The law (discovered by Mr. Elliott) which governs the breeding seals in hauling, viz, that the size of the rookery varies directly as the number of seals, seems to me, after close and repeated observation, to be correct. All the rookeries, whether large or small, are uniform in appearance, alike compact, without waste of space, and never crowded; such being the case, it is unimportant to know the actual number of seals upon the rookeries, for any change in the number of seals, which is the point at issue, any noteworthy increase or decrease in the size of the rookeries, taken collectively, will show a corresponding increase or decrease in the number of breeding seals, consequently in the number of pups born, upon which, of course, the extent and safety of the fisheries depend. If, then, a plan or map of each rookery be made every year, showing accurately its size and form when at its greatest expansion, which is between the 10th and 25th of July, a comparison of them would give the relative number of the breeding seals from year to year. I will submit with this report maps[1] of St. Paul and St. George islands, showing the extended location of breeding rookeries and hauling grounds from surveys in July, 1874, made by Mr. Elliott and myself, and a map of each rookery on both islands, drawn from careful surveys made by Mr. Elliott in 1872, showing them as they were in the season of 1874 as compared with that of 1872. I respectfully recommend that enlarged copies of these latter maps be furnished to the Government agents in charge of the islands, and that they be required to compare them each year with the respective rookeries, and note the change in size and form, if any exist, upon them. This, if carefully done, will afford data, after a time, by which the fisheries can be regulated with comparative certainty, so as to produce the greatest revenue to the Government without injury to the seals.

Since 1870 there have been killed on both islands, in round numbers, 112,000 young male seals each year. Whether this slaughter has prevented the seals from increasing in numbers or not, and if so, to what extent, can only be deduced from their past history, which unfortunately is imperfectly known. In 1839 there were fewer seals upon the islands than had ever been seen before since their discovery in 1786. On St. Paul there were not more than twelve or fifteen thousand of all kinds. The killing of them was then stopped, and not resumed until 1845, when it was done gradually, and, as had never been the case before, only the young males were killed. The rookeries continued to increase in size until 1857, since which time they have remained about the same, although a less number were killed yearly between 1857 and 1868 than have been killed since. This would seem to show that there is a limit beyond which they will not increase and that this limit has been reached. If they could be under our control and protection at all times, and if a sufficient supply of food for them could be procured, we should doubtless be able to cause them to multiply, for there are more of both sexes born each year than necessary to meet the loss from the natural causes of old age, disease (unless epidemic), and accident. But in reality we do not even know where they are for seven months in each year, while we do know that they have deadly enemies, which make sad havoc, particularly among the pups and yearlings, as a single killer-whale has been found to have 14 young seals in his stomach when killed. Our protection of them can only be partial; that is to say, we can limit the number to be killed when they are within our reach, and prevent

[1] Missing. See *Report of H. W. Elliott*, *ante*, pp. 776-778.

their being disturbed on the breeding rookeries or driven from the islands. On the other hand, the question arises whether the killing of the number above mentioned has or has not caused a decrease of the seals. Judging from a comparison between the maps of the rookeries, as they were in 1872, and the rookeries themselves this year, and from the testimony of the best-informed men on the islands, both whites and natives, I think it has not as yet. As the young males alone are killed, injury would be effected through them, by not allowing a sufficient number to reach maturity to supply the demands of the rookeries. They do not go on the rookeries until they are at least 6 years old; hence the effect of the first year's killing can not be seen until the pups born then have reached that age. For that reason it seems to me that it is too soon to decide whether we are killing too many or not. It is possible that more, even twice as many, might be taken without injury, but it would be making a severe and more hazardous experiment, before any results have been obtained from the first. The number now killed annually is entirely experimental, and we have nothing to start from as a basis. Until the effect produced is satisfactorily shown, I would, therefore, not recommend an extension of the contract as to the number of seals to be killed, until seven or eight years from the date at which the one now existing went into effect, when, if the rookeries have not decreased in size, it can safely be done.

THE NATIVES OF THE ISLANDS.

St. Paul and St. George islands were uninhabited when discovered by Pribilof in 1786, but in that year, and at various times since, the Russian transferred a number of Aleuts, with their families, from the island of Unalaska to them. The descendants of these people, together with a few Russian creoles from various parts of the territory, are the present native inhabitants of the islands. Their population on the 1st of August was as follows:

Island.	Number of people.	Number of families.	Males.	Females.	Adult males.	Adult females.	Aleuts.	Creoles.
St. Paul	225	62	104	121	72	67	54	171
St. George	123	26	58	65	27	31	22	101

They live in a single village on each island, the one on St. Paul situated at the southeastern end, and on St. George on the north shore. They were Christianized by the Russians, and worship according to the forms of the Greek Catholic Church. In disposition they are mild and amiable, and are skillful and faithful workers at their business of taking seal skins.

Strictly speaking, there is no form of government among them, though their chiefs, elected by themselves, have a certain degree of control, particularly in directing the labors of the sealers. They have a great respect for law and authority, as disobedience to the commands of their Russian rulers was punished with great severity. There have not been many criminal cases or misdemeanors thus far since the transfer of the territory, and none of a serious nature, merely a few cases of assault and petty theft, which were readily settled by the Government agent, assisted by the chiefs. But as the special agents of the Treasury Department, who are the only representatives of the Government at the islands, have not been invested as yet with any governing power, it

seems necessary that some means should be provided for securing to all equal protection in the rights of person and property. This could be accomplished for the present, at least, by giving them authority somewhat similar to that of justice of the peace, making them responsible to the Secretary of the Treasury for the proper performance of that duty, as they are for that of those with which they are now charged. The seals furnish the natives with a comfortable and certain living, their flesh serving them for food, and the taking of their skins bringing substantial income.

THE LEASE OF THE ISLANDS.

In June, 1870, Congress passed an act entitled "An act to prevent the extermination of fur-bearing animals in Alaska," which authorized the Secretary of the Treasury to lease to private parties for a term of years the right to engage in the business of taking fur seals on the islands of St. Paul and St. George, under certain specified conditions and restrictions. Therefore the subject was publicly advertised and bids solicited, the privilege to be awarded to the highest responsible bidder. A number of individuals doing business in San Francisco, under the firm name of the Alaska Commercial Company, were the successful bidders, and the right was granted to them under the terms of the lease now in force (a copy of which is annexed) for a period of twenty years from the 1st day of May, 1870. The terms were not arranged and the lease delivered until the 31st day of August, 1870, and the vessels and agents of the company did not reach the islands until the 1st of October. The season allowed by law for killing seals being nearly over, but few were taken that year (3,448 on St. Paul and 5,789 on St. George), but the following and each succeeding year they have taken the stipulated number. When the lease was made it was erroneously supposed that there were about one-third as many seals on St. George Island as on St. Paul, and in consequence the number to be taken from each island was fixed at 25,000 and 75,000 respectively. In reality there are only about one-eighteenth as many on the former as the latter, which fact having been clearly shown last year by Mr. Elliott, the apportionment was changed to 10,000 for St. George and 90,000 for St. Paul, according to the terms of the lease. In consideration of being the only company allowed to take fur seals upon the islands, the Alaska Commercial Company has agreed to pay a yearly rental for the use of the islands, and a tax or duty upon each skin taken and shipped from them; not to kill more than the stipulated number of seals, and seals of a particular kind; not to molest them upon the rookeries or in the water, and to do nothing which would tend to frighten them from the islands; to provide for the comfort, maintenance, education, and protection of the native inhabitants, and neither to furnish nor to allow its agents to furnish distilled spirits or spiritods liquors to any of the natives.

The company employs on St. Paul an agent who has general charge of the business on both islands, three assistants, a physician, a school-teacher, three carpenters, a cooper, a steward and cook; and on St. George an agent, a physician, a school-teacher, and a cook.

The great work of the season, the taking and curing of seal skins, begins the first week in June, and is pushed forward as rapidly as possible, as the skins are in the best condition early in the season. This year 90,000 skins were taken on St. Paul by 84 men in thirty-nine days. The natives do all the work of driving, killing, and skinning the seals, and of curing and bundling the skins, under the

direction of the company's agents and of their own chiefs. The first operation is that of driving the seals from the hauling to the killing grounds. The latter are near the salt houses, which are built at points most convenient for shipping the skins, and all the killing is done upon them, in order not to disturb the other seals, and to save the labor of carrying the skins. The seals suitable for killing (which are the young males from 2 to 6 years old) are readily collected into droves upon the hunting grounds by getting between them and the water, and are driven as easily as a flock of sheep. They move in clumsy gallop, their bellies being raised entirely from the ground, upon their flippers, which gives them, when in motion, the appearance of bears. They are sometimes called "sea bears" on account of this resemblance. In driving them care is taken not to hurry them, for, if driven too fast they crowd together and injure the skins by biting each other, and also become overheated and exhausted. They are driven from one-half mile to 5 miles in from three to thirty-six hours, according to the location of the hauling grounds. After reaching the killing grounds they are allowed to rest and cool for several hours, particularly if the drive has been a long one. The drives vary in number from five hundred to as many thousand, as there happen to be few or many seals upon the hauling-ground when the drive is made. In each drive there are some seals that are either so large or so small that their skins are not desirable, and sometimes a few females are driven up, not often, however, as they seldom stray from the rookeries. All such are singled out and permitted to escape to the water. The killing is done with a blow on the head by a stout club, which crushes the skull, after which the skins are taken off and carried into the salt houses. During the first half of the month of June, from 5 to 8 per cent of the seals in the drive are turned away, being either too small or too large, and from 10 to 12 per cent during the latter half. In July the percentage is still greater, being about 40 per cent for the first and from 60 to 75 per cent for the latter half. About one-half of the seals killed are about 3 years old, one-fourth 4, and the remainder 2, 5, and 6. No yearlings have been killed up to the present time, though allowed by the lease, as their skins are too small to be salable in the present state of the trade, but by some trade in it they may become desirable in the future, and would then be taken. This would injure the fisheries, because the yearlings of both sexes haul together, and it would be almost impossible to separate them so as to kill only the males. There has been a waste in taking the skins, due partly to the inexperience of the company's agent and partly to accident and the carelessness of the natives. In making the drives, particularly if they are long, and the sun happens to pierce through the fog, some of the seals become exhausted and die at such a distance from the salt houses that their skins can not well be carried to them by hand, and are therefore left upon the bodies. This was remedied during the last killing season by having a horse and cart to follow the drive and to collect such skins. Some skins have also been lost by killing more seals at a time than the force of men employed could take care of properly. Good judgment and constant care are required in taking the skins, as fifteen minutes' exposure to the sun will spoil them by loosening the fur. Another source of waste is by cutting the skins in taking them off in such a manner as to ruin them. It was very difficult at first to induce the natives to use their knives carefully, and several hundred skins were lost in a season by careless skinning; but by refusing to accept and pay for badly cut skins the number has been greatly reduced, so that the loss this year on St. Paul

was but 130 from all causes. The salt houses are arranged with large bins, called kenches, made of thick planks, into which the skins are put, fur side down, with a layer of salt between each layer of skins. They become sufficiently cured in from five to seven days, and are then taken from the kenches and piled up in books, with a little fresh salt. Finally, they are prepared for shipment by rolling them into compact bundles, two skins in each, which are secured with stout lashings. The largest of these bundles weighs 64 pounds, but their average weight is but 22. The smallest skins, those taken from seals 2 years old, weigh about 7 pounds each, and the largest, from seals 6 years old, about 30.

The skins are counted four times at the island, as follows: By the company's agent and the native chiefs when they are put into the salt houses, the latter given in their accounts, after each day's killing, to the Government agent; again when they are bundled by the natives, who do the work, as each is paid for his labor by the bundle; by the Government agents when they are taken from the salt houses for shipment, and the fourth time by the first officer of the company's steamer, as they are delivered on board. An official certificate of the number of skins shipped is made out and signed by the Government agents in triplicate, one copy being sent to the Treasury Department, one to the collector at San Francisco, the third given to the master of the vessel in which they are shipped. The amount of the tax or duty paid by the company to the Government is determined by the result of a final counting at the custom-house in San Francisco. The books of the company show that it has paid into the Treasury, since the date of the lease, $170,480.45 on account of the rental of the islands, and $1,057,709.74 tax on seal skins, which sums also appear in those of the Treasury Department. The latter sum is less by $16,458.63 than the tax that should have been paid had 100,000 skins been taken each year since 1870, or, in other words, 6,269 fewer skins have been shipped than the lease permitted. The record kept at the islands, by both the Government's and company's agents, shows that in 1871 but 19,077 skins were taken on St. George, instead of 25,000, the number allowed, and that nearly every year since, the number shipped has fallen a little short of 100,000.

In addition to the seals killed by the company for their skins, about 12,000 are killed annually, under the direction of the Government's agents, to supply the natives with food. Between 7,000 and 8,000 of these are pups, killed in November and scattered for consumption during the winter, when there are no seals on the islands. The remainder are bachelor males, killed between the months of April and November, at times when none are being killed by the company. The skins of the pups are too small and inferior to be salable, but are tanned and used by the natives for robes, carpets, etc. Those taken from the others are good, except those taken in August and September, when they are "stagey," and are accepted by the company and counted as a part of their quota. The seals shed their coat of hair and get a new one between the months of June and October. Skins are said to be stagey when the hair of the new coat has not grown long enough to project beyond the fur, and are consequently injurious to it, as they can not be plucked out. No use is made of the carcasses of the dead seals, which are left on the killing grounds to be decomposed and dispensed by the action of the elements. It was thought at first that a large amount of valuable oil could be obtained from them, and the company agreed to pay a tax of 55 cents a gallon for all that should be shipped or sold, but after making about 8,000 gallons in 1871–72, it was found that the cost of making and shipping it to San Francisco was greater than the price it brought there,

so no more has been made since, and none has ever been shipped. The tax was taken off last year and the company simply required to pay to the natives 10 cents per gallon for their labor in making the oil, but during the sealing season the entire working force of the natives is fully occupied in taking the skins, and after it is over they are unwilling to do the work of trying out oil from the carcasses, for, as they say, they make money enough by sealing. They do, however, make a few gallons for themselves yearly, which they use for burning. Care is taken to prevent molesting or frightening the seals; no dogs are allowed upon the islands, and the use of firearms is prohibited except in winter. It has been asserted that the sight of blood and the sight of the killing of their companions has a tendency to drive them away from the islands, but the experiment has been tried of fastening tallies to numbers of the seals which are turned away from the killing grounds, and always with the result that the same seals have been found upon the beach and driven again within a day or two. Moreover, there is a breeding rookery within sight of the killing grounds on St. Paul, and but a short distance from them, which has been increasing in size for several years.

TREATMENT OF THE NATIVES BY THE COMPANY.

The lease requires that provision be made by the company for the comfort, maintenance, education, and protection of the native inhabitants of the islands.

The natives do all the work of taking and curing the seal skins, for which they are paid by the company 40 cents a skin. This produces each year a fund of $40,000, which is divided between the inhabitants of the two islands, according to the number of skins taken from each, which gives $30,000 to the people of St. Paul and $10,000 to those of St. George. In addition to this they are paid 40 cents apiece for sea-lion skins, 10 cents for their throats, and $5 a barrel for their intestines. As this sum is earned by the joint labor of all the able-bodied men, it is considered a common fund, to be divided equitably among them. Payment is made for all other labor to each individual performing it at established rates. In dividing the sealing fund the ability of the sealers is considered, and the division made accordingly. Thus the strongest and most skillful men, who work the entire season, receive a first-class share. Those who are less skillful, and the old men who are unable to do the harder part of the work, receive second and third shares, while the boys who take part in the sealing for the first time receive a fourth-class share. The assignment of shares is made by the chiefs and acquiesced in by the others. Each year, after all the skins have been taken, the chiefs furnish the company's agents with a list of the men who have been engaged in sealing during the season, and the share assigned to each. The second, third, and fourth class are respectively 90, 80, and 70 per cent of the first-class share. Two first-class shares are voluntarily given for the support of the church, and one for that of the priest. The value of the shares varies a little from year to year with the number of men engaged in sealing. This year (1874) it was for each, respectively, $429.53, $368.58, $343.62, and $300.63. The result of the division is formally made to the people by the company's agents, through the chiefs and in the presence of the Government's agents. These sums are not paid at the time to the natives, but are placed to their credit in the book of the company and in passbooks which are furnished to each man. All other labor is paid for in coin when performed, at the rate of from 6 to 10 cents an hour, according to the

nature of the work, except that of bundling skins, which is at the rate of 1 cent a bundle. The first chief is paid a monthly salary of $15, and each of the others, three in number, are of $10, in addition to their shares of the sealing fund. Other natives, men and women, employed throughout the year in other capacities, receive from $4 to $30 a month and board.

Clothing, provisions, and other articles are kept in the company's storehouses on the island, and are sold to the natives at prices not exceeding those for which the same could be bought at retail in San Francisco. I examined the goods and found them to be of good quality. The people have but little idea of economy, and would spend all their money in a short time for certain articles of which they are fond, hence it is necessary to limit their sale, such as butter, sugar, and perfumery. They are encouraged to save money by the company, which receives deposits from them, subject to the usual rules of "savings banks," and pays an interest of 9 per cent per annum. Deposits range from $100 to $1,100. The church has a deposit of $8,000. Some are in debt to the company, but become less so every year. Such as are without means of support, widows, and orphan children are supported by the company.

The natives live partly in "barabbakies," or earth houses, and partly in comfortable frame houses. Thirty of the latter have been built within the last two years by the company, and given rent free. Others are being built as rapidly as possible, it being the intention of the company to give each family a house. The lease requires the annual delivery upon the island of 60 cords of firewood and 25,000 dried salmon, for the use of the natives; but, with the consent of the Secretary of the Treasury, coal, ton for cord, has been substituted for the former, and an equivalent quantity of salted salmon and codfish for the latter. Both have been regularly supplied, as shown by the receipts of the Government agent and the statements of the natives, together with as much salt and as many barrels as has been desired for curing and storing their seal meat.

Two physicians are in the employ of the company, one residing on each island, who are charged with the care of the sick, and have already, by their efforts, seconded by the example of the other white residents, induced greater cleanliness and a more healthful mode of living among the natives.

The education of the native children has not been neglected, though so far the attempt to teach them has not been as successful as could be desired. For each island a competent teacher, a convenient and well-warmed schoolroom, and a supply of schoolbooks, etc., have been provided every year from the 1st of October until the 1st of June, but the difficulty has been to induce the parents to send their children, as they do not think them able to learn both English and Russian, and as the latter is the language of their church they consider it the most important. The average attendance at the school on St. George has been but 5 or 6, while there are from 30 to 40 children, and on St. Paul but 4 or 5, with from 40 to 50 children. Last year on the latter island there was a better attendance, and the children made considerable progress. The prejudice of the older people seems likely to wear away, as they learn a little English themselves from constantly hearing it, and will doubtless disappear after a time.

The company has wisely adopted a fair and liberal policy in its dealings with the natives, and is more than repaid for the expense incurred by the increased ease and rapidity with which they work while taking

skins. I examined carefully the books and papers of the company, both at its office in San Francisco and upon the island; also the record kept by the Government agents, and talked privately with the most intelligent of the natives, but was unable to discover that there has been any fraud practiced toward the Government, or want of compliance with the terms of the lease.

The natives keep a jealous watch upon the seals, being fully impressed with the fact that their welfare depends upon the safety of the fisheries, and are well informed in regard to all laws and contracts which have been made by the Government concerning them.

THE SEA OTTER.

During the Russian occupation of Alaska Territory the trade of sea otter skins was of greater value and importance than any other branch of the fur trade, both from the high prices obtained for them, and also from the numbers which were taken. They were sent to China, where they were advantageously exchanged for tea and cloth. One sea otter skin brought as much as 10 seal skins, and from 10 to 20 times as much as any other skins found in Alaska. Fur seals, beavers, and foxes were the only animals taken in greater numbers. The demand for this fur and the improvident manner of taking the animals have greatly diminished their numbers, though the value of the skins is perhaps even greater than formerly.

In early times sea otters were found along the outer seacoast from California to the westernmost of the Aleutian Islands, also about the Prybilof group, and Cook mentions having seen a few of them at St. Matthew Island. It does not appear that they have ever been found on the coast of the mainland north of the Alaskan peninsula. They were more abundant along the coast of the Aleutian Islands and along the coast as far as Sitka. South of that point they were less numerous, and were taken mostly from Queen Charlottes Islands, Greys Harbor, firth north of the Columbia River, and the coast of California in the vicinity of Russian River. For more than a century they have been hunted almost incessantly, and killed without regard to age or sex, wherever found, yet they still frequent some of their favorite haunts, though in comparatively limited numbers. At the present time a few of them are killed at Greys Harbor by white hunters and Indians, and along the coast to the northward as far as Cooks Inlet by the Indians, but they are very scarce.

The Aleutian Islands and those south of the Alaska peninsula, including Kodiac, are the only places where any considerable numbers are found. The yearly catch averages about 3,500, of which from 400 to 500 are from Kodiac and that vicinity and the remainder from the islands to the westward of these. About one-twentieth are prime skins, one-sixth pups less than one year old, and the rest middling and ordinary. The finest are taken near Otter Island, the most westerly of the Aleutians, and Kodiac; the greater number about Leanak Island and the "Chenabour Rocks."

The full-grown animal is from 3½ to 4 feet long, exclusive of the tail (which is from a foot to 14 inches long), and is in the shape of its body something like a beaver; the head is rather small and the nose pointed, with whiskers on each side like the sea lion and seal, but shorter and fewer in number. Their legs, four in number, are short and small, and the toes are connected by a membrane. The skin is very loose upon the body; so much so that by seizing it about the middle of the back

a foot or more of slack may be taken up, and when taken off, dried, and slightly stretched it is from 7 to 9 feet long. The male rarely weighs more than 70 or 75 pounds, and is slightly larger than the female, though the latter has usually the best fur. It is very difficult to ascertain their habits, as they frequent the most exposed and dangerous portions of the coast and seldom go upon the land; but most of the hunters agree to the following facts concerning them:

They are rarely seen on shore except in winter, when they sometimes haul in great numbers on outlying rocks, particularly after a severe gale, when there is a heavy surf. During the summer they go several miles off shore, and are sometimes seen sleeping upon the kelp or on the water. They breed apparently either upon the kelp or in the water, as there has never been an instance observed of a female giving birth to her young on the land. The young are about 12 inches long, and are believed to suck until one year old. They reach their full growth in about from three to five years. They are covered with a coarse hair of a mixed gray, yellow, and brown color (mostly gray upon the head, neck, and belly), until 6 months old, when this is gradually replaced by a black fur. The mother, when swimming, carries her pups between her paws, and sleeps on the water on her back, holding them in the same manner. The food of the sea otter consists of shellfish, such as the ray or clam, crabs, and sea urchins, and probably kelp. They obtain a shellfish by diving, often in 15 fathoms of water; and after bringing them to the surface, crush their shells between their claws and breast. They are often seen playing together, but never fighting; though when wounded it is almost impossible to catch them with the hands, as they bite severely and are so lithe and supple that it is difficult to prevent their doing so. Their flesh is eaten by the natives, and is considered better than that of the fur seal, though inferior to the sea lion's. They are strong, swift swimmers, swimming even against a gale of wind with considerable rapidity, and nearly always upon their backs, propelling themselves with their hind legs. Their fur is considered equally good at all seasons; hence they are hunted throughout the entire year.

The method of taking them varies with the season and locality. In summer they are usually killed in the water with spears or caught in nets, and in winter are either shot while swimming in the surf or clubbed upon the rocks. They are very shy and keen of scent, which necessitates the greatest care on the part of the hunter while hunting them. They do not build fires or even light their pipes with the wind in a certain direction, and sometimes go without a fire for six weeks at a time in winter.

In taking the sea otters with spears the hunters assemble with their baidarkies, or skin canoes, in parties of 50 or more, each baidarkie carrying 2 men—one to paddle and the other to use the spear. They then go off shore sometimes 20 miles, and watch quietly for an otter to show his head above water, which he no sooner does than the men in the nearest baidarkies paddle swiftly toward him shouting and throwing their spears. This frightens the animal, causing him to dive. As soon as he disappears the nearest baidarkie goes to the spot where he went down and remains there, while the others form a large circle about it and wait for him to reappear. This he does in from fifteen to thirty minutes, usually inside the circle, and the foregoing operation is quickly repeated, so as not to give him time to recover his breath. This is kept up until the otter becomes so much exhausted and out of breath that he can only remain under water for a minute or two, and must finally

come up near enough to one of the baidarkies to be easily speared. The skin belongs to the hunter whose spear is nearest the head. This method of hunting is common to the natives of all the islands, but the hunters of the island of Atka are the only ones who catch them in nets. The nets used are made of twine, usually about 14 feet by 8, though sometimes as large as 120 feet by 90. They are spread on top of a bed of kelp, and the ends anchored with heavy stones. The otters at certain times go upon the kelp to sleep, and in moving about upon it become entangled in the meshes of the net and are then easily killed by the hunters. As many as six have been caught at one time in a single net. When caught in this way they do not struggle and try to break away, though it would seem an easy matter for so powerful an animal. But sea lions sometimes get in the nets and break them all to pieces. The natives of Atka have always hunted this way, but those of the other islands have never done so. At the island of Laenack in the winter during a severe northwest gale, especially if it occurs immediately after a southeaster, the surf is very heavy and the otters haul up on the rocks to get out of it. At such times, as soon as the gale begins to abate, the hunters go out in their baidarkies, and by keeping to the leeward are able to land upon the rocks, creep up to the otters and kill them with clubs. If care is used to make no noise and to kill the ones to the leeward first, they are frequently able to take all of them. Seventy-eight were killed in one morning by 3 men a few years ago, and it is not unusual to get from 10 to 30. It is not very often, however, that these opportunities for clubbing them occur. They are also killed with firearms in winter from the shore while swimming in the surf and in summer from boats. The older hunters are very much opposed to this method of hunting, as they say it drives away the otter, and that being easier than spears the young men practice it and neglect to learn the use of the spear.

The value of the skins depends upon the length, fineness, and color of fur. Those which have long, thick, fine fur, of a rich, glossy, black color, tipped with silvery gray, are the most highly prized. Inferior ones have coarser fur and reddish brown in color. Some have been taken with fur as coarse as the hair of the sea lion, similar in color. Spotted and striped skins have also been found, but rarely.

The skins of pups less than one year old are unsalable, on account of their mixed color and lack of fur, but some of the finest are taken from those between one and three years of age.

Sea otters are constantly becoming less numerous in the waters of Alaska Territory, from three causes—the killing of females and pups less than a year old, the incessant harassing caused by hunting them from year to year without intermission, and the use of firearms. About one-half the number killed each year are females, and one-sixth pups too young to be of any value. The killing of females works a double injury, for if they have young less than six months old the killing of the mother causes the death of the pup.

It would contribute largely to the preservation of the sea-otter life if they were allowed to remain undisturbed, either for three of four months each year throughout the entire region frequented by them or for two or three years at a time in certain portions of it. Either plan would give them an opportunity to rest and breed. The use of firearms in hunting them should also be discontinued. Though simple in theory, it would be difficult in practice to afford this protection, as the extent and character of the sea-otter district, and the competition between both traders and hunters, would render the enforcement of any laws which might be made for the purpose no easy matter.

THE ISLANDS OF ST. LAWRENCE AND ST. MATTHEW.

These two large islands, lying in Bering Sea, are a part of the territory purchased from Russia by the United States. Though discovered and named by Bering in 1728–1741, and repeatedly visited since by explorers, traders, and whalers, so little had been put on record concerning them that no correct idea could be formed of their character and value. Their comparative unimportance is probably the reason for this.

The larger of the two, St. Lawrence, lies first south of Bering Strait, in latitude (its southwest point) 63° 23′ N., and longitude 120° 35′ W. It is about 90 miles long, and has an average width of 15 miles. The surface is irregular and broken, consisting of hills connected by low, flat plains, which are but a few feet above the level of the sea. Both the ranges of hills and the lowland extend entirely across the island from north to south; hence, when approached from either direction, the latter are not seen at first, and the land has the appearance of being several separate islands. Captain Cook, who discovered it in 1778, was thus deceived, and as he did not sail near enough afterwards to discover his mistake gave the supposed group the name of Cleaks Islands. There are no harbors, but good anchorage can be found at several points, with from 6 to 11 fathoms of water, in light weather or when the wind is from the land. It is covered in summer with grass, moss, and flowers, and in places a creeping willow grows, but neither trees nor shrubs of any kind. There are several lagoons, and numerous fresh-water ponds, fed by small streams from the hills, are distributed over the plains. The greater part of the shore line is a low sand beach, but at the southwestern end of the island, and at several points on the northern shore, it rises into almost perpendicular cliffs, from 100 to 300 feet high. Those at the southwestern end present a singular appearance when viewed from the water. The beating of the surf and the action of the frost have broken up and worn away the material of which they are composed (talcose slate), leaving needles or spires, some of them 100 feet in height, standing out several yards from the cliff. Deep cracks or fissures, extending from top to bottom, have also been formed in the cliffs, which are filled from the water's edge with solid masses of snow (although it was in the month of August we saw them), beautifully colored in many places by bird guano and reddish substance in the rock. The hills are composed principally of granite and present everywhere rounded outlines very different from the sharp edges and points seen on the volcanic islands to the southward. The island is inhabited by Eskimo who resemble closely those found on the midland between Bristol Bay and Holzebun Sound. They live in four widely spread villages, situated near the extremities of the island. One of the men seen by us could speak a few words of English and all could say "yes" and "tobacco," but none of them understood Russian or Aleut, though their language seemed similar to that of the "Kodiac-Aleuts."

The total population is between 150 and 200 souls. The men are tall and straight, without hair upon their faces except a slight mustache and a few scattered hairs upon the chins of old men. They have black hair and eyes, and their complexion is of a very light copper color.

Their dress consists of a kind of a shirt, reaching halfway to the knee, made in some cases of tanned reindeer skin, and in others of bird skins (feathers outside). It fits closely around the neck, and has a hood that can be drawn over the head, lined with the fur of dogs and foxes, or with bird skins. It is confined at the waist by a belt, from which hang

a sheath knife and a skin tobacco pouch. Their breeches are made of tanned hair-seal skin, fitting the legs closely, and tied at the ankle with leather strings. They wear on their feet a kind of a moccasin made of seal skin, with a sole of walrus hide. The dress of the women is somewhat different. Their upper garment is made of the intestines of the walrus, neatly sewed together, and is similar in shape to that of the men, but longer, and worn without a belt. Beneath this they wear short drawers, reaching only to the knee, made of tanned seal skins. Instead of moccasins they wear a sort of boot, the legs of which are made of either the throat or intestines of the walrus, and the sole of walrus hide. Most of the men shave the crown of their heads, leaving only a rim of their hair, about an inch wide, entirely around the head. The women do not cut their hair, but part it in the middle, and wear it in two braids with strings of beads intermixed. Their foreheads, cheeks, chins, and arms are tattooed in various devices with a light blue pigment of some kind, and the ears of some have little notches cut in them. None of the men are tattooed, but many wear little strings of beads in their ears. Their countenances are bright and rather intelligent, and both men and women are lively and talkative. Their habitations are of two kinds, being designed for summer and winter occupation. The summer houses are portable, and are evidently shifted from place to place. They are about 15 feet square and 6 feet high, and consist of light framework of wood covered entirely, sides, ends, and roof, with dried walrus skins. The roofs have a very low pitch, and slope slightly to the rear. The interior of one which we entered was divided into three nearly equal spaces, by logs of driftwood laid upon the ground in two parallel lines. The two outer ones were covered with skins and used for sleeping places. There was a fire built between several large stones, burning near the center of the house, about which were their cooking utensils, consisting of two sheet-iron kettles and several wooden bowls. The latter were used for boiling water by throwing into them heated stones. They had also platters and smaller bowls neatly made of wood. Hanging about in various parts of the hut were reindeer and hair-seal skins, skins of wild geese and ducks, walrus and whale meat, bladders of oil, articles of clothing, and numbers of smoked fish; also their weapons, which are long wooden spears, with coarse iron points, bows and arrows, knives, and a few smoothbore muskets. They seemed to have but a small supply of ammunition for the latter, as they used small stones for bullets, though they had a few buckshot. Their only tools are their knives and small adzes made both of walrus ivory and iron. Yet they make the frames of their boats and wooden vessels with great nicety. There were 14 people living in this house, 5 men, 6 women, and 3 children. They seemed hospitably disposed, inviting us to enter their house, and offering us boiled fish and whale's meat. Their winter house, which was near the other, was built under ground (the roof only appearing above the surface), and showed great attention to comfort in its construction. It was rather larger, and square in form, with a dome-shaped roof. The sides were walled with wood, and had a raised bunk extending around three of them. The floors were also of wood. The roof was thickly covered with earth and turf, except a small round hole in the center, left open to supply air, light, and a passage for the smoke, but which could be closed by a wooden shutter on the inside. The entrance to the house was through a square hole in the ground at a distance of several yards from the house, but connected with it by a narrow underground passage. This house contained the greater part of their posses-

sions, consisting of sleds, snowshoes, boat frames, paddles, fish spears, and larger ones for killing the walrus and whale; household utensils, walrus tusks, strung together with pieces of hide, and various toys evidently made for the amusement of the children. The sleds were made of wood, with short, solid runners shod with bone, and all their parts were lashed together with strips of walrus hide. The snowshoes consist of an oval form of wood about 2 feet by 8 inches, with strips of hide stretched across. Near the winter house were caches of oil and walrus meat, doubtless intended for a supply of food for the coming winter. Their boats are from 20 to 30 feet long, sharp at both ends, and from 3 to 4 feet wide across the gunwale. The frames are made of wood, without nail or pin, but neatly and firmly fastened with lashings of whalebone; over them walrus skins, cut to the proper shape and sewed together with a water-tight seam, are stretched smoothly and lashed to the gunwale with strips of hide. They are propelled both by paddles and oars, and a small sail is hoisted when running before the wind.

The people were anxious to trade for tobacco, needles, guns, and ammunition, offering in exchange walrus ivory, hair-seal skins, articles of their clothing, oil, and whalebone; they all begged for tobacco, but did not seem to know or care about spirits. Their principal trade is with the natives of the neighboring Asiatic coast, distant only 60 miles from the western end of St. Lawrence, who supply them with reindeer, marmot, and other skins, in return for boats, frames, and other wooden articles. There is no wood growing upon the island, but an abundance of driftwood from the river Yukon is deposited along its eastern and southern shores. The only animals seen by us upon the island, besides the dogs belonging to the natives, were walruses, blue foxes, and lemmings, though polar bears must sometimes come from the Arctic on the ice, as we saw several of their skulls up near a village. Hair seals are found about the island, but neither fur seals nor sea lions were seen, or anything indicating that they ever come there. Waterfowl of many different species and in great numbers frequent it in summer, and are caught by the natives in large nets made of strips of walrus hide. These are stretched on poles at points most favorable for catching the birds, which, in flying about, strike against the nets and become entangled in their meshes.

Trout are found in the streams and a species of whitefish in the ponds.

At best it is a most barren and most unprofitable piece of land. It is probably never entirely free from snow, for though the winter of 1873–74 was unusually mild and the spring an early one, yet there was much snow upon the hills in August, and a northerly wind reduced the temperature to 34°+F. It is surrounded by ice from October till June, and in the summer months the dense fogs which prevail most of the time render it difficult to approach. There is a group of three small islands called Poonook, lying about 6 miles southeast from the southeastern point of the eastern end of St. Lawrence, which are easily distinguished by two small cone shaped hills upon the largest. There was a winter house upon that island not occupied at the time, though the effects of the natives were in it, and there were several *caches* of oil near by.

The Russian chart of the island is incorrect, both in the shore line and position of reefs. I respectfully submit with this report a chart in which such errors are corrected as far as was possible, and giving some additional surroundings and hydrographic information.

ST. MATTHEW ISLAND.

About 200 miles south-southwest from St. Lawrence is the island of St. Matthew, which is much smaller, and uninhabited. Bering discovered it in his voyage to the American coast, 1741, and thirty-seven years later it was rediscovered by Cook, who gave it the name of Gores Island, but the name it now bears, given by Bering, has been retained. Its northern shore is nearly straight, except at the northwestern end, which curves to the northward, but the southern is indented by numerous small bays and coves. Nearly two-thirds of its shore line consists of rocky cliffs, which rise almost perpendicularly from the sea in heights varying from 50 to 1,600 feet, and the remainder of low gravel beach. The surface of the island is divided in about the same proportion into broken and hilly sections, connected by low, level plains. The southeastern end terminates in three converging ridges which, on the land side, slope gradually to the plains, but to seaward rise abruptly from the water, forming a continuous wall of solid rock from 300 to 1,500 feet high, to which Cook gave the name of Cape Upright. At a distance it appears to be separated from the rest of the island, but is joined to it by a neck of low land from one-half to three-quarters of a mile in width and about 3 miles long. On the south shore, about 9 miles northwest from Cape Upright, there is a steep conical hill 1,520 feet in height, and on the north shore, near the northwestern end, is a bluff 1,670 feet high. These three elevations are visible from nearly every part of the island, and are excellent landmarks. The action of moving ice in changing the surface of the land is beautifully shown in many parts of the island. Its vegetation comprises several species of grass, flowering plants and moss, wild wheat, and the creeping willow. The rocks in many places are covered with a black luster of a leathery texture and insipid. There are several large lagoons and a great number of small ponds of fresh water. Springs of clear, cold water burst out among the hills, and small streams, which either flow into the ponds or fall over the cliffs into the sea. These streams are filled with brook trout from 6 to 18 inches long, beautifully colored and spotted, but no fish were caught in the pond.

The only animals found were the white or polar bear, the walrus, the hair seal, blue fox, and lemming. These bears were probably brought there on ice, but whether they go and come during the winter and remain upon the island at all times we had no means of determining. Whalers and others who have been upon or passed near it at different times say that they have always seen bears. They were quite numerous, 16 having been counted at one time from the deck of our vessel, and tracks made by them lead to shallow holes or beds, upon the tops of the highest hills, where it is probable they breed, as there are neither caves nor holes of any kind upon the island. The females were accompanied by their cubs, from one to three in number, which were (in August) about one-third grown. They feed upon grass and roots, grazing along the banks of the stream like cattle; also upon the flesh of the walrus and hair seal, and birds and their eggs. They were not at all fierce, and showed no disposition to attack, even though wounded, but in every instance ran at the approach of man. We shot a number of them, and found their flesh very good eating. The largest one, a full-grown male, measured 8 feet from the end of the nose to the tail, and 24 inches around to fore leg, after being skinned. We had no means of weighing him, but his weight could not have been much less than 1,500 pounds.

They are good swimmers, swimming usually with their heads above water, though they can dive and swim for some distance entirely submerged. Neither fur seal nor sea lion breed upon the island or haul up along its shores, and there is nothing to indicate they have ever done so, but this is explained by the character of the beaches and the presence of so many bears. The cliffs are occupied in summer by millions of birds, shags, gulls, sea pannotts, murries, chulskies, and in and about the pond were eider-ducks, Canada geese, plovers of several kinds, curlew, large blue cranes, and burgomaster gulls. There is a small island 2½ miles north-northwest from the northwestern end of St. Matthew, called Hall Island, which is about 6 miles long and 3 wide. It is high and rocky, except at the southern end, where it terminates in a comparatively low point, and is a favorite resort of bears and walruses. About 7 miles west-southwest from Cape Upright, at the opposite extremity of St. Matthew, and 3½ of the nearest point of its southern shore, there is a lofty rock, three-quarters of a mile long and one-tenth wide, which rises perpendicularly from the sea to the height of 1,200 feet. Its upper edge is broken into numerous sharp points resembling pinnacles, from which circumstance it has been called Pinnacle Island. It is doubtless a volcano, as a deep and wide fissure extends from top to bottom in the direction of its length, the sides of which are blackened as by fire; and it is noted in the log of the United States revenue cutter *Reliance* that in July, 1870, while passing near St. Matthew to the southward, this rock was seen to be in a state of violent eruption.

The climate is similar to that of the Prybilof Islands, though probably somewhat colder in winter.

I respectfully submit a chart[1] of the island, drawn from a survey made by Mr. H. W. Elliott and myself, which gives its form, extent, and general topography.

LEASE OF THE ISLANDS.

This indenture in duplicate, made this 3d day of August, A. D. 1870, by and between William A. Richardson, Acting Secretary of the Treasury, in pursuance of an act of Congress approved July 1, 1870, entitled "An act to prevent the extermination of fur-bearing animals in Alaska," and the Alaska Commercial Company, a corporation duly established under the laws of the State of California, acting by John F. Miller, its president and agent, in accordance with a resolution at a meeting of its board of trustees, held January 31, 1870, witnesseth:

That said Secretary hereby leases to the said Alaska Commercial Company, without power of transfer, for the term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur seals on the islands of St. George and St. Paul within the Territory of Alaska, and to send a vessel or vessels to said island for the skins of such seals.

And the said Alaska Commercial Company, in consideration of their right under this lease, hereby covenant and agree to pay, for each year during said term and in proportion during any part thereof, the sum of $55,000 into the Treasury of the United States in accordance with the regulations of the Secretary to be made for this purpose under said act, which payment shall be secured by deposit of United States bonds to that amount, and also covenant and agree to pay annually into the Treasury of the United States, under said rules and regulations, internal-revenue tax or duty of $2 each for seal skin taken and shipped by them in accordance with the provisions of the act aforesaid, and also the sum of 60¼ cents for each fur-seal skin taken and shipped, and 55 cents per gallon for each gallon of oil obtained from said seals, for sale in said island or elsewhere, and sold by said company; and also covenant and agree, in accordance with said rules and regulations, to furnish, free of charge, the inhabitants of the islands of St. Paul and St. George annually during

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[1] Missing.

said term 25,000 dried salmon, 60 cords firewood, and a sufficient quantity of salt and a sufficient quantity of barrels for preserving the necessary supply of meat.

And the said lessees also hereby covenant and agree during the term aforesaid to maintain a school on each island, in accordance with said rules and regulations and suitable for the education of the natives of said islands, for a period of not less than eight months in each year.

And the said lessees further covenant and agree not to kill upon said island of St. Paul more than 75,000 fur seals, and upon the island St. George not more than 25,000 fur seals per annum; not to kill any fur seal upon the islands aforesaid in any other month except the months of June, July, September, and October of each year; not to kill said seals at any time by the use of firearms or means tending to drive said seals from said islands; not to kill any female seals or seals under one year old; not to kill any seal in waters adjacent to said islands or on the beach, cliffs, or rocks, where they haul up from the sea to remain.

And the said lessees further covenant and agree to abide by any restriction or limitation upon the right to kill seals under this lease that the act prescribes or that the Secretary of the Treasury shall judge necessary for the preservation of such seals.

And the said lessees hereby agree that they will not in any way sell, transfer, or assign this lease, and that any transfer, sale, or assignment of the same shall be void and of no effect.

And the said lessees further agree to furnish to the several masters of the vessels employed by them certified copies of this lease, to be presented to the Government revenue officers for the time being in charge of said islands, as the authority of said lessees for the landing and taking of said skins.

And the said lessees further covenant and agree that they or their agents shall not keep, sell, furnish, give, or dispose of any distilled spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine.

And the said lessees further covenant and agree that this lease is accepted subject to all needful rules and regulations which shall at any time or times hereafter be made by the Secretary of the Treasury for the collection and payment of the rental herein agreed to be paid by said lessees for the comfort, maintenance, education, and protection of the natives of said islands, and for carrying into effect all the provisions of the act aforesaid, and will abide by and conform to said rules and regulations.

And the said lessees, accepting this lease with a full knowledge of the provisions of the aforesaid act of Congress, further covenant and agree that they will fulfill all the provisions, requirements, and limitations of said act, whether herein specifically set out or not.

In witness whereof the parties aforesaid have hereunto set their hands and seals the day and year above written.

[SEAL.] WILLIAM A. RICHARDSON,
Acting Secretary of the Treasury.

[SEAL.] ALASKA COMMERCIAL COMPANY,
By JOHN F. MILLER, *President.*

Executed in presence of—
J. H. SAVILLE.

In accordance with the provisions of "An act to prevent the extermination of fur-bearing animals in Alaska," approved July 1, 1870, and considering the fact, that one-half of the present season for killing fur seals has already expired before the making of a lease as therein authorized and required, and that the killing, during the remainder of the season, of the full number of fur seals limited by said act, would tend to the extermination of the fur-bearing animals, and that further restrictions and limitations for this year have become necessary for the preservation of such seals, the right of killing fur seals on the islands of St. Paul and St. George, in said Alaska, during the present year, A. D. 1870, is further restricted and limited as follows:

First. The number of fur seals which may be killed for their skins during the year 1870, upon the island of St. Paul, is hereby limited and restricted to 37,500.

Second. The number of fur seals which may be killed for their skins during the year of 1870, upon the island of St. George, is hereby limited and restricted to 12,500.

And the rent of $55,000 reserved to the Government in the lease under said act to the "Alaska Commercial Company," bearing date August 3, 1870, is proportionately reduced for the first year of said lease, to wit, $27,500, without otherwise affecting any agreement of covenant therein made on the part of said company, August 9, 1870.

WILLIAM A. RICHARDSON,
Acting Secretary of the Treasury.

Whereas by a certain indenture made August 3, 1870, between William A. Richardson, then Acting Secretary of the Treasury, and the "Alaska Commercial Company," a corporation duly established under the laws of the State of California, it was covenanted and agreed as follows, to wit:

"And the said lessees further covenant and agree not to kill upon said island of St. Paul more than 75,000 fur seals, and upon the island of St. George not more than 25,000 fur seals per annum; not to kill any fur seals upon the islands aforesaid in any other month except the months of June, July, September, and October of each year; not to kill such seals at any time by the use of firearms or other means tending to drive the seals from said islands; not to kill any female seal or any seals less than 1 year old; not to kill any seals in the waters adjacent to said islands or on the beaches, cliffs, or rocks, where they haul up from the sea to remain."

Now this indenture made this 25th day of March, 1874, by and between William A. Richardson, Secretary of the Treasury, in pursuance of an act of Congress approved March 24, 1874, and entitled "An act to amend an act to prevent the extermination of fur-bearing animals in Alaska," approved July 1, 1870, and the said Alaska Commercial Company, lessees in said indenture of August 3, 1870, acting by John F. Miller, its president and agent, in accordance with a resolution of said corporation duly adopted at a meeting of the board of trustees held January 31, A. D. 1870:

Witnesseth, that the parties hereto do hereby mutually agree to rescind and annul, from and after the ratification hereof, the within-recited covenant in said indenture of August 3, 1870, and in place thereof the said Alaska Commercial Company, lessees, as aforesaid, do hereby covenant and agree not to kill upon the island of St. Paul more than 90,000 fur seals, and upon the island of St. George not more than 10,000 fur seals per annum; not to kill any fur seals upon the island aforesaid in any other months except the months of June, July, August (from the 1st to the 15th of said month), September, and October of each year; not to kill such seals at any time by the use of firearms or other means tending to drive the seals from said islands; not to kill any female seals or any seals less than 1 year old; not to kill any seals in the waters adjacent to said islands, or on the beaches, cliffs, or rocks where they haul up from the sea to remain.

And the said parties hereto, by virtue of the act of Congress herein referred to, hereby agree that the covenant set forth in said indenture of August 3, 1870, and herein recited, shall, from and after the ratification of this indenture, be revoked, rescinded, and the covenant hereby entered into shall be and remain in force as the covenant of the parties hereto in this regard from and after the ratification hereof during the remainder of said lease of August 3, 1870.

In witness whereof the said parties have hereto set their hands and seals the day and year above written.

[L. S. TREASURY.] WILLIAM A. RICHARDSON,
Secretary of the Treasury.

[L. S. ALASKA COMMERCIAL COMPANY.] LEWIS GERSTLE,
Vice-President, Acting President
Alaska Commercial Company.

We, the obligors in a certain bond dated August 3, 1870, given in accordance with the provisions of an act of Congress approved July 1, 1870, entitled "An act to prevent the extermination of fur-bearing seals in Alaska," hereby consent to the within change made in a lease given by the Secretary of the Treasury to the Alaska Commercial Company under said act, dated August 3, 1870, and agree that the said change shall not discharge us from any liability under said bond.

Witness our hands and seals this 25th of March, 1874.

JOHN SANOTT,
LEWIS GERSTLE.

HOUSE DOCUMENT NO. 175, 54TH CONGRESS, 1ST SESSION.

REPORT

OF

HENRY W. ELLIOTT

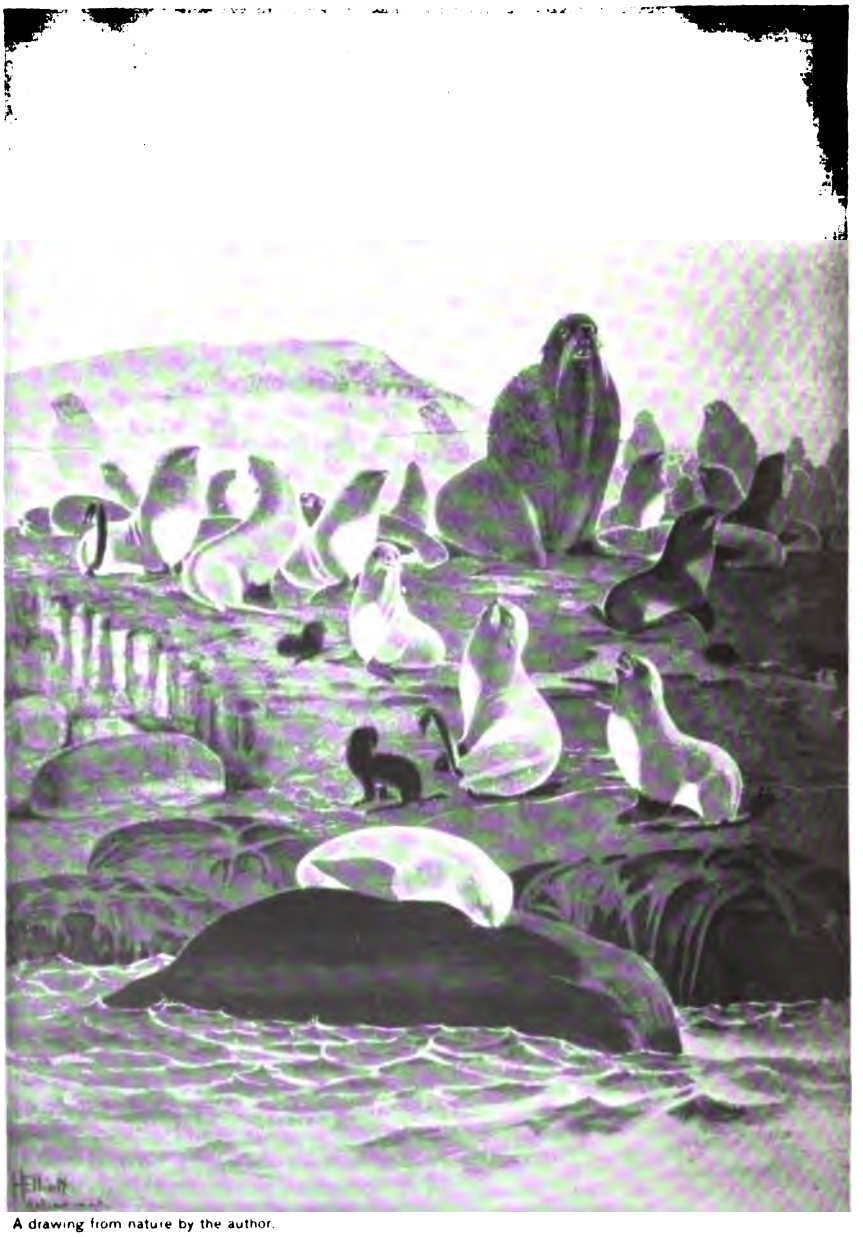
ON

The Condition of the Fur-Seal Fisheries of Alaska,

TOGETHER WITH

ALL MAPS AND ILLUSTRATIONS ACCOMPANYING SAID REPORT.

PLATE 1.



A drawing from nature by the author.

A GROUP OR HAREM OF FUR SEALS (*Callorhinus ursinus*), SAINT PAUL ISLAND, JULY 13, 1890.

Old bulls 7 feet long, weight 400 to 600 pounds; adult females 4 feet long, weight 80 to 100 pounds. These old bulls have been here without leaving their stations for a moment since the 5th to 20th of May; they will have reduced their weight to less than 200 or 250 pounds by the end of this month; the females feed at frequent intervals and never lose their weight.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING,

In response to the House resolution of the 22d instant, a copy of the report of Henry W. Elliott on the condition of the Fur-Seal Fisheries of Alaska, together with all maps and illustrations accompanying said report.

JANUARY 27, 1896.—Referred to the Committee on Ways and Means and ordered to be printed.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., January 25, 1896.

SIR: I have the honor to acknowledge the receipt of a copy of House resolution, dated the 22d instant, wherein I am requested to furnish the House of Representatives with a copy of the report of Henry W. Elliott, made pursuant to the order of special act approved April 5, 1890, on the condition of the fur-seal fisheries of Alaska, together with all maps and illustrations accompanying said report, as submitted to the Secretary of the Treasury on November 17, 1890.

In reply thereto a copy of the report in question and its original inclosures are transmitted herewith. The original inclosures are forwarded, instead of copies, at the request of the author of the report, who claims that the original color maps should be sent, instead of photographic copies, as the latter fail to express the idea involved.

With the report is transmitted also an original paper forwarded to this Department on the 2d of February last by Mr. Elliott, which purports to be a transcript from his field notes in 1874, and which, owing to its complicated character, can not be copied without recourse to photographic or electrotyping processes. The paper referred to has been inserted by Mr. Elliott on page 29 of the inclosed copy of the report.

If practicable, the return of the inclosed original documents to the files of this Department is requested.

Respectfully, yours, J. G. CARLISLE,
Secretary.

Hon. THOMAS B. REED,
Speaker of the House of Representatives.

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A drawing from nature by the author.

OTTER ISLAND. (5½ miles distant.) SOUTHWEST POINT. (16 miles distant.) BOGASLOV. (600 feet.) POLAVINA SOPKA. (550 feet.) NORTHEAST POINT. (17 miles distant.)

VIEW OF SAINT PAUL ISLAND, PRIBILOV GROUP.

From the SE., August 11, 1890.

PLATE 2.

REPORT UPON THE CONDITION OF THE FUR-SEAL ROOKERIES OF THE PRIBILOV ISLANDS OF ALASKA.

By HENRY W. ELLIOTT,
Special Agent, Treasury Department.

CLEVELAND, OHIO, *November 17, 1890.*

SIR: On the 7th of last April I received from your hands my appointment as the special agent under an act of Congress, approved April 5, 1890, which orders and provides for a thorough examination into the present status of the fur-seal industry of our Government as embodied on the seal islands of Alaska, so as to make known its relative condition now as compared with its prior form and well being in 1872, and for other kindred lines of inquiry.

I may as well frankly confess at the outset that I was wholly unaware of the extraordinary state of affairs which stared me in the face at the moment of my first landing last spring on the seal islands of Alaska. I embarked upon this mission with only a faint apprehension of viewing anything more than a decided diminution of the Pribilov rookeries, caused by pelagic sealing during the last five or six years.

But, from the moment of my landing at St. Paul Island, on the 21st of last May, until the close of the breeding season. those famous rookeries and hauling grounds of the fur seal thereon, and of St. George Island, too, began to declare and have declared to my astonished senses the fact that their utter ruin and extermination is only a question of a few short years from date, unless prompt and thorough measures of relief and protection are at once ordered at sea and on land by the Treasury Department, and enforced by it.

Quickly realizing after my arrival upon these islands that a remarkable change for the worse had taken place since my finished work of 1874 was given to the public in that same year, and the year also of my last survey of those rookeries, I took the field at once, carrying hourly and daily with me a series of notebooks opened under the following heads:

I. The "rookeries," their area, position, and condition in 1872–1874, and 1890.

II. The "hauling grounds," their appearance in 1872–1874 and 1890.

III. The method of "driving," and taking fur seals in 1872–1874, and 1890.

IV. The selection of skins, grade, and supply in 1872–1874 and 1890.

V. Character, condition, and number of natives in 1872–1874 and 1890.

VI. Conduct of native labor and pay in 1872–1874 and 1890.

To these heads I add the following sections, the whole series making up my report in the order as they are here given:

VII. The protection and preservation of these fur-bearing interests

of our Government on the Pribilov Islands, and that immediate action necessary, viewed in the full light of existing danger.

VIII. Appendix, in which the author's daily field notes appear *verbatim et literatim*, in order of day and date.

IX. Revised general maps of St. Paul and St. George, showing the area and position of the hauling grounds of the fur seal thereon in 1872–1874 and again in 1890.

X. A series of special maps showing the exact topography, area, and position of the breeding rookeries of St. Paul and St. George islands in 1872–1874 and again in 1890, together with an illustration of each rookery, drawn from life by the author.

Although I was unable to detect any sign of existing danger or injury to those interests of our Government on these islands of Pribilov in 1872–1874, yet the need of caution on the part of the agents of the Government, and their close annual scrutiny, was pointed out and urged by my published work of 1874[1] in the following language (pp. 75–77):

Until my arrival on the seal islands, April, 1872, no steps had been taken toward ascertaining the extent or the importance of these interests of the Government by either the Treasury agent in charge, or the agent of the company leasing the islands. This was a matter of no especial concern to the latter, but was of the first importance to the Government. It had, however, failed to obtain definite knowledge upon the subject, on account of the inaccurate mode of ascertaining the number of seals which had been adopted by its agent, who relied upon an assumption of the area of the breeding rookeries, but who never took the trouble to ascertain the area and position of these great seal grounds intrusted to his care.

After a careful study of the subject during two whole seasons, and a thorough review of it during this season of 1874, in company with my associate, Lieutenant Maynard, I propose to show plainly and in sequence the steps which have led me to a solution of the question as to the number of fur seals on the Pribilov Islands, together with that determination of means by which an agent of the Government will be able to correctly report upon the condition of the seal life from year to year.

At the close of my investigation for the season of 1872, the fact became evident that the breeding seals obeyed implicitly a fine, instinctive law of distribution: so that the breeding ground occupied by them was always covered by seals in an exact ratio, greater or less as the area was held; that they always covered the ground evenly, never crowding in at one place and scattering out at another; that the seals lay just as thickly together where the rookery is a small one of only a few thousand, as at Nahspeel, near the village, as they do where a million of them come together, as at Northeast Point.

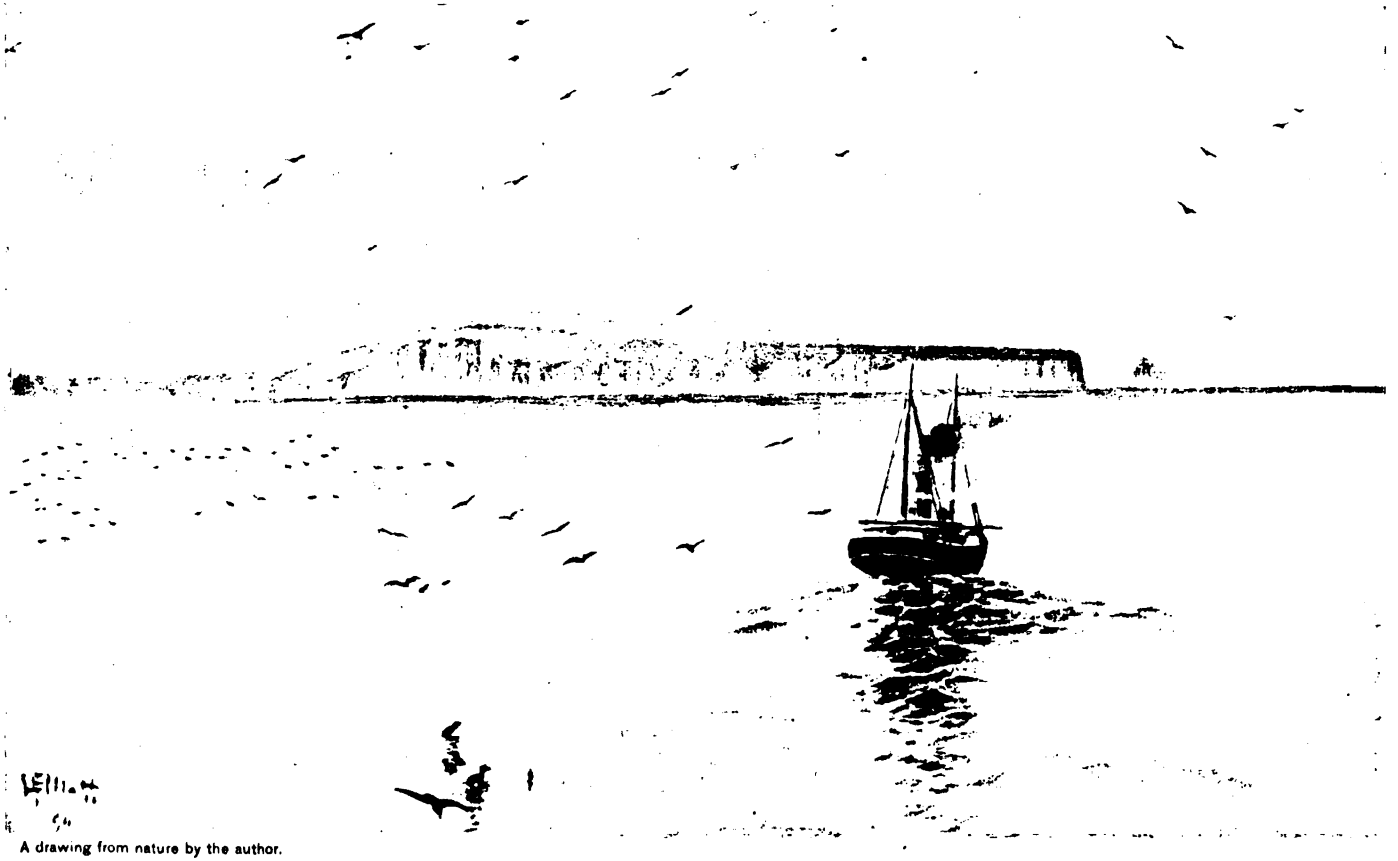
This fact being determined, *it is at once plain that just as the breeding grounds of the fur seal on these islands expand or contract in area from their present dimensions, so the seals will have increased or diminished.*

Impressed, therefore, with the necessity and the importance of obtaining the exact area and position of these breeding grounds, I surveyed them in 1872–73 for that purpose, and resurveyed them this season of 1874. The result has been carefully drawn and plotted out, as presented in the accompanying maps.

The time for taking the boundaries of the rookeries is during the week of their greatest expansion, or when they are as full as they are to be for the season, and before the regular system of compact, even organization breaks up: the seals then scattering out in pods or clusters, straying far back, the same number covering then twice as much ground in places as they did before when marshaled on the rookery ground proper. The breeding seals remain on the rookery perfectly quiet and *en masse* for a week or ten days during the period of greatest expansion, which is between the 10th and 20th of July, giving ample time for the agent to correctly note the exact boundaries of that area covered by them. This step on the part of the Government officer puts him in possession every year of exact data upon which to base a report as to the condition of the seal life as compared with the year or years previous. In this way my record of the precise area and position of the fur-seal breeding grounds on St. Paul Island in the season of 1872, and that of St. George in the season of 1873, correctly serves as a definite basis for all time to come, upon which

[1] A Report upon the Condition of Affairs in the Territory of Alaska, by Henry W. Elliott, special agent Treasury Department. Washington: Government Printing Office, 1875. pp. 277, 8vo.

PLATE 3.



A drawing from nature by the author.

WATERFALL HEAD. (7 miles distant.) GARDEN COVE. (5 miles distant.) SEA LION BLUFFS. TOLSTOI MESS. (5 miles distant.) DALNOI MESS. (15 miles distant.)

VIEW OF THE EAST SHORE OF SAINT GEORGE ISLAND, PRIBILOV GROUP.
Looking WSW., August 11, 1890.

to found authoritative reports from year to year as to any change, increase, or diminution of the seal life. It is therefore very important that the Government should have an agent in charge of these novel and valuable interests who is capable, by virtue of education and energy, to correctly observe and report the area and position of the rookeries year by year.

Therefore, in the light of the foregoing, you will observe that although I was unable to detect, myself, any danger to or diminution of the seal life on the Pribilov Islands after three seasons of close study in the field, ending with the season of 1874, yet I was deeply impressed with the need of an intelligent, careful search every year for the signs of, or real existence of such danger; and I urged the Department to select men who were fit to make such a search: men who could be trusted to do it honestly and thoroughly. I made this request on the 16th of November, 1874, as I gave in my detailed report above cited, to the Secretary of the Treasury, who ordered it published at once and caused it to be widely circulated by the Department.

In 1872–1874 I observed that all the young male seals needed for the annual quota of 75,000, or 90,000, as it was ordered in the latter year, were easily obtained every season between the 1st of June and the 20th of July following, from the hauling grounds of Tolstoi, Lukannon, and Zoltoi Sands—from these hauling grounds adjacent to the rookeries or breeding grounds of Tolstoi, Lukannon, Reef, and Garbotch—all of these points of supply being not more than 1½ miles distant from the St. Paul village killing grounds: the Zoltoi drive being less than 600 feet away.

At Northeast Point on this island Webster got all the seals desired toward filling the above-cited quota of 90,000 from that sand reach between the foot of Cross Hill and the Big Lake sand dunes on the north shore beach.

Then that immense spread of hauling ground covered by swarms of young male seals at Zapadnie, at Southwest Point, at English Bay, beyond Middle Hill, west, at Polavina, and over all that 8 long miles of beach and upland hauling ground between Lukannon Bay and Webster's house at Novastoshnah—all of this extensive sealing area was not visited by sealing gangs or spoken of by them as necessary to be driven from. In this connection it is proper to say that the name of Middle Hill was not known or given to that or any other particular point in English Bay or elsewhere when I surveyed the island in 1872–1874: it was not so named until a few years afterwards; and was never known as a sealing drivers' title until then.

Therefore, when attentively studying in 1872–1874 the subject of what was the effect of killing annually 100,000 young male seals on these islands (90,000 on St. Paul and 10,000 on St. George), in view of the foregoing statement of fact, I was unable to see how any harm was being done to the regular supply of fresh blood for the breeding rookeries: since those large reservoirs of surplus male life above named, held at least just half of the young male seal life then belonging to the islands. These large sources of supply were never driven from: never even visited by the sealers: and out of their overwhelming abundance I thought that surely enough fresh male seal life must and did annually mature for service on the breeding rookeries.

Thereupon, when recapitulating in my published work of 1872–1874, I was positive in declaring that although I was firmly convinced that no increase to the then existing number of seals on these islands would follow any effort that we might make (giving my reasons in detail for so believing), yet I was as firmly satisfied that as matters were then conducted nothing was being done which would injure the regular annual

supply of male life necessary for the full demand of the rookeries. I then declared "that provided matters are conducted on the seal islands in the future as they are to-day, 100,000 male seals, under the age of 5 years and over 1, may be safely taken every year from the Pribilov Islands without the slightest injury to the regular birth rates or natural increase thereon; provided, also, that the fur seals are not visited by any plague, or pests, or any abnormal cause for their destruction which might be beyond the control of men."[1]

I repeatedly called attention to this fact in my published report that all of the killable seals required were easily taken in thirty working days between June 14 and July 20 of every year, from those points above specified: and that those reservoirs of surplus male life at Southwest Point, Zapadnie, English Bay, Polavina, Tonkie Mees,[2] etc., were full and overflowing; that more than enough was untouched which sufficed to meet the demands of nature on the breeding grounds. But, to make certain that my theory was a good one and would be confirmed by time, *for I qualified my statement at that time as a theory only*, I made a careful and elaborate triangulation of the area and position of the breeding grounds in 1872–73 on St. Paul and St. George islands, aided and elaborated by my associate in 1874, Lieut. Washburn Maynard, U. S. N. This I did in order that any increase or diminution following our work could be authoritatively stated; *that a foundation of fact and not assumption should exist for such a comparison of the past order with that of the present or the future.*

Sixteen years have elapsed since that work was finished; its accuracy as to the statements of fact then published, was at that time unquestioned on these islands, and it is to-day freely acknowledged there. But what has been the logic of events? Why is it that we find now only a scant tenth of the number of young male seals which I saw there in 1872? When did this work of decrease and destruction so marked on the breeding grounds there begin, and how? This answer follows:

First. From overdriving, without heeding its warning: first begun in 1879: dropped then until 1882: then suddenly renewed again with increased energy from year to year, until the end is abruptly reached this season of 1890.

Second. From the shooting of fur seals (chiefly females) in the open waters of the North Pacific Ocean and Bering Sea: begun as a business in 1886 and continued to date.

Thus, the seal-life candle has been literally "burning at both ends" during the last five years!

That day in 1879, when it became necessary to send a sealing gang from St. Paul village over to Zapadnie to regularly drive from that hitherto untouched reserve, was the day that danger first appeared in tangible form since 1870—since 1857, for that matter.

The fact, then, that that abundant source of supply which had served so well and steadily since 1870–1881, should fail to yield its accustomed returns to the drivers, ought to have aroused some comment, ought then to have been recorded by the officer in charge in behalf of the Government at the close of the season's work in 1882; but it did not. Possibly the gravity of the change was not then fully appreciated by the sealers themselves, either through ignorance or inattention.

But, when in 1882, it became absolutely necessary to draw from that time on, until the end of the present season, heavily and repeatedly,

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[1] Monograph of the Seal Islands of Alaska, p. 62.

[2] "Tonkie Mees," or Thin Point: named "Stony Point" by the white sealers in 1879, when they first began their killing on that ground; erected a salt house, etc.

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A drawing from nature by the author.
TOLSTOI.

LOWER ZAPADNIE.

UPPER ZAPADNIE.

MIDDLE HILL.

HOLLUSCHICKIE HAULING ON THE SANDS OF ENGLISH BAY, JULY 18, 1872. NATIVES "CUTTING OUT A DRIVE."
View looking west from Tolstoi Sand Dunes, over the bay to Zapadnie and Southwest Point, Saint Paul Island.

upon these hitherto untouched sources of supply for the rookeries, in order to get the customary annual quota—at that time that fact, that glaring change from the prosperous and healthy precedent and record of 1870–1881, should have been—it was—ample warning of danger ahead. It seems, however, to have been entirely ignored, to have fallen upon inattentive or incapable minds; for, not until the report for 1889 from the agent of the Government in charge, who went up in the spring of that year for his first season of service and experience—not until his report came down to the Treasury Department, had there been the slightest intimation in the annual declarations of the officers of the Government of the least diminution or decrease of seal life on these islands since my work of 1874 was finished and given to the world!

On the contrary, strange as it may seem, all the Treasury agents since 1879 have, whenever they have spoken at all, each vied with the other in their laudations of the "splendid condition of the rookeries," "fully up to their best standard," etc., and one report in 1887 declares a vast increase over the large figures which I published in 1872–1874! which is again reiterated by the same officer in 1888.

But, how could these gentlemen reconcile their statements with that remarkable evidence of the decrease in supply of young males from the records made and before them—staring them in the face—of 1872–1874? When they saw and daily recorded the fact that sealing gangs were being daily sent out from the village, miles and miles away to hitherto undisturbed fields, for killable seals—the regular, customary hauling grounds then at the point of exhaustion from which an abundant supply had been easily secured during the last thirty years, and grass growing all over the hauling grounds of 1872—how, indeed, did that fact escape their attention? It did, however; it was utterly ignored.

I can see now, in the light of the record of the work of sixteen consecutive years of sealing, very clearly one or two points which were wholly invisible to my sight in 1872–1874. I can now see what that effect of driving overland is upon the physical well being of a normal fur seal: and, from that sight feel warranted in taking the following ground:

The least reflection will declare to an observer that while a fur seal moves easier on land and freer than any or all other seals, yet, at the same time, it is an unusual and laborious effort, even when it is voluntary; therefore, when thousands of young male seals are suddenly aroused to their utmost power of land locomotion over rough, sharp rocks, rolling clinker stones, deep, loose sand, mossy tussocks, and other equally severe impedimentia, they, in their fright, exert themselves violently, crowd in confused sweltering heaps, one upon the other, so that many are often smothered to death; and, in this manner of most extraordinary effort, to be urged along over stretches of unbroken miles, they are obliged to use muscles and nerves that nature never intended them to use, and which are not fitted for the action.

This prolonged, sudden, and unusual effort, unnatural and violent strain, must leave a lasting mark upon the physical condition of every seal thus driven and then suffered to escape from the clubbed pods or the killing grounds. They are alternately heated to the point of suffocation, gasping, panting, allowed to cool down at intervals, then abruptly started upon the road for a fresh renewal of this heating as they lunge, shamble, and creep along. When they arrive on the killing grounds, after four or five hours of this distressing effort on their part, they are then suddenly cooled off for the last time prior to the final

ordeal of clubbing. Then, when driven up into the last surround or "pod," the seals which are spared by cause of being unfit to take—as too big or too little, bitten, etc.—are permitted to go off from the killing ground back to the sea, outwardly unhurt, most of them; but I am now satisfied that they sustain, *in a vast majority of cases, internal injuries of greater or less degree*,[1] that remain to work physical disability or death thereafter to nearly every seal thus released, and certain injury to its virility and courage so necessary for its station on the rookery, even if it does live to successfully run this gauntlet of driving throughout every sealing season for five or six consecutive years, driven over and over again, as it is, during each one of these sealing seasons.

Therefore it now appears plain to me that those young male fur seals which may happen to survive this terrible strain of four or five successive years of driving overland, are rendered by this act of driving, wholly worthless for breeding purposes; that they never go to the breeding grounds and take up stations there, being utterly demoralized in spirit if not in body.

With this knowledge, then the full effect of "driving" becomes apparent; and that result of slowly but surely robbing the rookeries of a full and sustained supply of fresh nervy young male blood, demanded by nature imperatively for their support up to the standard of full expansion (such as I recorded in 1872–1874)—that result began, it now seems clear, to set in from the very beginning, twenty years ago, under the present system.

Had, however, a check been as slowly and steadily applied to that "driving" as it progressed in 1879–1882 upon those great reserves of Zapadnie, Southwest Point, and Polavina, then the present condition of exhaustion, complete exhaustion, of the surplus supply of young male seals as compared with the number of females to-day, would not be observed—it would not have happened.

But, however, no attention was given whatever to the fact that in 1882 the reserves were suddenly, very suddenly, drawn upon, steadily and heavily for the first time, in order that a prompt filling of the regular annual quota should be made before or by the usual time of closing the sealing season for the year, viz, July 20; and, until the report

[1] I have been repeatedly astonished at the amazing power possessed by the fur seal of resistance to shocks which would certainly kill any other animal. To explain clearly, you will observe, by reference to my maps, that there are a great many cliffy places between the rookeries on the shore lines of the islands. Some of these cliffs are more than 100 feet in abrupt elevation above the surf and rocks awash below. Frequently "holluschickie," in ones or twos or threes, will stray far away back from the great masses of their kind, and fall asleep in the thick grass and herbage which covers these mural reaches. Sometimes they will lie down and rest very close to the edge, and then as you come tramping along you discover and startle them and yourself alike. They, blinded by their first transport of alarm, leap promptly over the brink, snorting, coughing, and spitting as they go. Curiously peering after them and looking down upon the rocks, 50 to 100 feet below, instead of seeing their stunned and motionless bodies, you will invariably catch sight of them rapidly scrambling into the water: and, when in it, swimming off like arrows from the bow. Three "holluschickie" were thus inadvertently surprised by me on the edge of the west face to Otter Island. They plunged over from an elevation there not less than 200 feet in sheer height, and I distinctly saw them fall, in scrambling, whirling evolutions, down, thumping upon the rocky shingle beneath, from which they bounded as they struck like so many rubber balls. Two of them never moved after the rebound ceased, but the third one reached the water and swam away like a bird on the wing.

While they seem to escape without bodily injury incident to such hard falls as ensue from dropping 50 or 60 feet upon pebbly beaches and rough bowlders below, and even greater elevations, yet I am inclined to think that some internal injuries are necessarily sustained in most every case, which soon develop and cause death The excitement and the vitality of the seal at the moment of the terrific shock is able to sustain and conceal the real injury for the time being.

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A drawing from nature by the author.
TOLSTOI ROOKERY.

ZAPADNIE POINT AND ROOKERIES.

MIDDLE HILL.
(In middle distance.)

VIEW OVER THE DESOLATE HAULING GROUNDS OF ENGLISH BAY, SAINT PAUL ISLAND, JULY 18, 1890.

Looking west from Tolstoi Sand Dunes. Contrast this view with the preceding picture made by the author from this same foreground, eighteen years ago.

for 1889, above cited, of the Treasury agent in charge, came into the Treasury Department, not a suggestion ever had been made in official writing, from 1872–1874, down to that time, of the slightest prospect even, of the amazing diminution of seal life which is now so painfully apparent.

Naturally enough, being so long away from the field, on reading Mr. Charles J. Goff's report for the season's work of 1889, I at once jumped to the conclusion that the pelagic sealing, the poaching of 1886–1889, was the sole cause for that shrinkage which he declared manifest on those rookeries and hauling grounds of the Pribilov Islands—such a great shrinkage as to warrant him in the declaration which he makes in that report that he believes that not over 60,000 young male seals can be secured here in 1890, and if more can be, that they should not be taken

Still, charging it in this manner all to the pelagic killing was not quite satisfactory to my mind. I could figure out from the known number of skins which these hunters had placed on the market, a statement of the loss and damage to the rookeries, to the females and young, born and unborn: for that is the class from which the pelagic hunter secures at least 85 per cent of his catch: I was prepared to find by these figures that the breeding grounds had lost heavily; but that did not even satisfy me as to his statement, which came so suddenly in 1889, that little more than half of the established annual quota of 100,000 holluschickie suitable for killing could or should be secured here in 1890; for, great as my estimated shrinkage on the breeding grounds was due to the pelagic work, yet that would not, could not, explain to my mind the ninefold greater shrinkage of that supply from the hauling grounds which must exist, or else 60,000 young males might be easily taken, judging from my notes of such work in 1872. Therefore, I landed here very much confused in thought as to what I should observe.

I began at once, and finished by the 9th of June, an entire new topographical survey and triangulation of the landed area of the seven rookeries of St. Paul Island: and those of St. George Island on the 19th and 20th of July: so as to have these charts ready for instant use when the time came in which to observe the full form and number of the breeding seals as they laid upon this ground, viz, July 10–20 inclusive; thereafter, until the closing of the season on St. Paul, July 19, and on St. George up to August 4, I have daily recorded the full details of the hauling, the driving, and killing of seals there, the condition of the breeding animals, their arrival and behavior, etc. A thousand varied incidents have been faithfully observed, as my field notes will testify, and which appear with much detail in the following appendix to this report.

The present condition of these fur-seal preserves is nothing new to the history of their case while in the hands of the Russians. Twice before in the comparatively short period of a century, when they were first opened to the cupidity of man, have they been threatened with the same ruin that threatens them to-day. In 1806 and 1807 all killing was stopped to save them, but resumed again in 1808; too soon; for, after seventeen years of halfway measures, the full and necessary term of rest was given to them in 1834. The story of this "zapooska" of the Russians in 1834, and the causes which led them to threaten the extermination of those fur-seal interests on the Pribilov Islands, is one that is now timely in its repetition and should be heeded.

When these islands were first discovered in 1786–87, an indiscriminate

rush was made to them by the representatives of every Russian trading organization then in Alaska: by every one then able to fit out a vessel and hire a number of men. These eager, greedy parties located on and near all of the large rookeries and hauling grounds, and killed as many as they could handle. In those days all the skins were air-dried, and not salted, and that made the work of sealing then far slower and much more difficult than it is now, since the present system of salting skins practically offers no delay whatever to the work of killing and skinning. In my mind there is no doubt but what this inability to cure rapidly the skins for shipment in 1786–1805, as fast as they could then be killed and skinned—not one-tenth as fast as they can be to-day—that this delay alone saved the Pribilov rookeries from utter extermination in those early days. Certainly it was and must have been the cause: for, at least thirteen different trading organizations had their vessels and their men around and on these two islands of St. Paul and St. George, engaged to their utmost ability throughout full seventeen years of unbroken succession in taking fur-seal skins.

Had those early Russian fur hunters then possessed the knowledge and means of curing skins in salt that we now have, together with these appliances in use to-day on the seal islands of Alaska, I am well satisfied in my own mind that they would have killed every fur seal that remained to show itself in less than three years after they began operations; that they would have swept every animal from these grounds long, long before the old Russian American Company assumed autocratic control of these interests in 1799, and extended it in 1805 over all Alaska as well.

But, fortunately for us and the world as well, they did not know anything about curing skins in salt; they had but one method, and that was to stretch out the green skins and air-dry them upon frames in long, low drying houses: or in bright weather, during August, September, and October, to peg them out upon the ground, or stretch them on hoops and frames.

Thus this tedious process, in a climate as damp, foggy, and stormy as is that peculiar to the seal islands of Alaska, made these Slavonian sealers spend ten times as much time in the act of curing their fur-seal pelts as it took them to drive out and kill. Then, too, in those early days they were remote from a market; had no prompt, economical means of transportation to London; and, depended wholly upon the idiosyncrasies of the Chinese trade, via Kiachta; but even with this extraordinary hindrance, it seems that they took in that laborious and risky manner at least 100,000 fur-seal skins every year.[1]

They took so many that by 1803, several hundred thousand of these air-dried pelts had accumulated over the ability of the old Russian company to profitably sell and dispose of, in time to prevent their decay—molding and damp, then abruptly decaying—rotting in large piles as they were stacked up in the warehouses at Kodiak; so "it became necessary to cut or throw into the sea 700,000 pelts" during that year. Naturally this loss of labor, time, and money cooled the ardor of the sealing gangs which were working the Pribilof Islands; they worked slower, when they did work, and most likely never worked at all in

[1] In the first years on St. Paul Island from 50,000 to 60,000 were taken annually and on St. George from 40,000 to 50,000 every year. Such horrible killing was neither necessary nor demanded. The skins were frequently taken without any list or count. In 1803, 800,000 seal skins had accumulated, and it was impossible to make advantageous sale of so many skins; for in this great number so many were spoiled that it became necessary to cut or throw into the sea 700,000 pelts. (Bishop Veniaminov, "Zapieskie," etc., 1848, vol. 1, chap. 12.)

wet weather. Obliged to bow to the caprices of the climate or lose their labor, they were compelled to spare the seals, and this enforced delay in 1788–1806 has saved the Pribilov rookeries from that swift destruction which the keen, quick-witted American and English sealers inflicted during 1806–1826, upon the great breeding grounds of the fur seal in the Antarctic. They, our countrymen, then used the kench and salt; they were never bothered with the question of how to dispose of their skins after killing and skinning so as to save them; and they brought their methods of 1806–1826, the same methods of to-day, up to these seal islands of Alaska for the first time in 1868.[1]

No one can state with more than mere estimation on his part the full number of seals slaughtered by the Russians on the Pribilov Islands from 1786 to 1817; no lists, no check whatever on it appears to have been made, and the record certainly never was made, since Bishop Veniaminov, who from 1825 up to 1838 was at the head of all matters connected with the church in this Oonalashka district, where the seal islands belonged: and who had the respect and confidence of the old Russian American Company, made a zealous search for such a record in 1834–35 among the archives of the company at Sitka, to which he had full access: but the result of his painstaking search he sums up in the following terse statement: "Of the number of skins taken up to 1817 I have no knowledge to rely upon, but from that time up to the present writing I have true and reliable accounts," which he puts into the appendix of his published work.[2]

The bishop (who is the only Russian who has given us the faintest idea of how matters were conducted in his time upon these islands) seems to have witnessed them in a uniform condition of decline as to yield; for, in the time of his writing and up to its closing in 1837, the record was one of steady diminution. Until 1834 the killing seems to have been permitted, with all sorts of half measures since 1817, adopted one after the other, to no good result whatever. Finally, however, the supply abruptly fell from an expected 20,000 to only 12,000 from both islands in 1834, "all that could be got with all possible exertion."

Then the Russians awoke to the fact that if they wished to preserve these fur-bearing interests on the Pribilov Islands from ruin they must stop killing: wholly stop for a number of years: stop until the renewal of the exhausted rookeries was manifest and easily recognized. This zapooska of 1835, which they then ordered, is the date of the renewed lease of life which these rookeries took: and, which by 1857, had restored them to the splendid condition in which they were when they passed into the hands of the United States: and which, now, after twenty-two years of killing since 1868, and under the recent regulations of 1870, together with the pelagic sealing since 1886, we find again threatened with speedy extinction unless full measures are at once adopted for their preservation and restoration on land and in the sea. Half meas-

[1] They began at once that system of disciplined, exhaustive slaughter which had proved so effective in their hands throughout the Antarctic—took nearly 250,000 seal skins on these islands in the short space of four months; ceased then only for the want of salt. But, happily, the Government intervened early in 1869, before they could resume their work of swift destruction. In 1854 the first salting of fur-seal skins was attempted on the Pribilov Islands, but the rudeness of the method caused trouble when the shipment reached London. In 1862 it was tried again by the Russians, but it was still crudely done until our people went to work in 1868 with their thorough methods. The Russians seldom bundled their skins when salted; they allowed them to dry while kenching in salt; and then shipped them just as they did their air-dried skins or "parchment" pelts.

[2] "Zapieskie ob Onalashkenskaho Otdayla," St. Petersburg, 1842, 2 vols. 8°. A full translation of that chapter which treats of that question will follow this introduction.

ures will not do; they failed in the Russian period signally; they will as signally fail with us if we yield in the slightest degree to any argument for their adoption.

It is interesting, therefore, to study the figures which Veniaminov gives us of the yield from these islands during that period extending down from 1817 to 1837. Study it in connection with his statement of what those attempts were, and which were being made—futile efforts by the old company to build up the business and yet continue sealing: until finally, after seventeen years of continual diminution and repeated introduction of halfway methods of restoration, the end came abruptly; and, what ought to have been done at first, was finally forced in 1834. The absolute rest of the rookeries in 1835 came and practically continued until 1846–1850; then a gradual rise above 10,000 "holluschickie," or young male fur seals, per annum, began to be safely taken; and by 1854 the exhausted and nearly ruined rookeries of St. Paul and St. George were able to yield 35,000 prime fur-seal pelts without the slightest injury to them; and, by 1857–1860 the seals were so numerous that the Russians ceased to regard them as objects of care, and thereafter governed their annual catch by the demands outside alone, taking as the market called for them anywhere from 40,000 to 80,000 annually.

As matters stand to-day on the seal islands, the situation is very much the same as it was in 1834. Then it was expected that 20,000 seals would be taken; but, only 12,000 were secured "with all possible exertion." This year it was expected that 60,000 fine skins would be taken; but, only 21,000 have been secured with all possible exertion, nearly half of this catch being small, or 5½ to 6½ pound skins, raking and scraping the rookery margins without a day's intermission from the opening to the closing of the season. Of this work of 1890, I give you in this report the fullest detail of its progression, day by day, to the merciful ending of it, ordered so happily by you.

It will be promptly observed from a study of this record of the Russians, which has been so plainly and honestly given to us by Veniaminov and Shaiesnickov, that the Russians during their control were faced at two periods with the prospect of a speedy extermination of these fur-seal rookeries of Alaska. In 1806 and 1807 they stopped all killing on these islands of St. Paul and St. George, but began to kill again in 1810; too soon. Veniaminov's record and account shows that from 1817, in spite of everything they could do, save stopping short of all killing, "only made matters worse."

Finally, in 1834, with the second and positive threat of swift extermination again facing them, the Russians reluctantly surrendered and ordered a rest, which lasted seven years ere any beginning was fairly made to kill more than a few thousand young male seals annually. In the first year only 100 of such animals were taken, the number being very slowly raised year after year until 1847–1850.

With reference to the preservation and conduct of this interesting and valuable industry, my study last summer of the subject has led me step by step to the following conclusions:

First. That we restrict and prohibit all killing of fur seals on the Pribilov Islands for tax and shipment of skins for the next seven years, without reflection on the present lessees: the Government to assume entire control, care, and supervision of the restoration of these interests during that period, since a division of responsibility will only provoke confusion and scandal, and probably result in defeating the object in view.

Second. This step on our part warrants us in asking the cooperation of Great Britain and Russia in establishing a close time for the protection of the fur seals of Bering Sea during their breeding season, and that final regulations be agreed upon *by a joint* commission, which shall consist of experts selected by the powers inter-

ested, and who shall visit the seal islands of Bering Sea next summer for that purpose. Pending the settlement of these regulations and the report of this commission, all pelagic sealing in Bering Sea to be declared illegal by the several powers interested.

In concluding this introduction to my work of the past season and its results, I desire to say that I have been exceedingly careful in gathering my data upon which I base all statement of fact and opinion, and to secure these data I have literally lived out upon the field itself, where those facts alone can be gathered honestly, or else, had better not be gathered at all.

I now submit, most respectfully, my detailed report covering the above-mentioned heads, together with those field sketches and maps which I deem necessary to give a more distinct, clear, and full idea of my meaning and understanding of the subjects treated. Trusting that it will meet with your approval,

I am, very respectfully, your obedient servant,

HENRY W. ELLIOTT.

Hon. WILLIAM WINDOM,
Secretary of the Treasury.

SECTION I.

THE ROOKERIES OR BREEDING GROUNDS OF THE FUR SEAL ON THE PRIBILOV ISLANDS OF ALASKA; THEIR AREA AND CONDITION IN 1872–1874 AND 1890.

GEOGRAPHICAL DISTRIBUTION OF THE FUR SEAL AND ITS EXTERMINATION IN THE ANTARCTIC.

PECULIARITIES OF DISTRIBUTION.

Our first thought in studying the distribution of the fur seals throughout the high seas of the earth is one of wonder. While they have been so widely spread over the Antarctic regions, yet, as we pass the equator going north, we find in the Atlantic above the tropics nothing that resembles them. Their landed habitat in the North Pacific is virtually confined to four islands in Bering Sea—St. Paul and St. George—of the Pribilov group, and Bering and Copper of the Commander Islands.

It should be observed that there is abundant reason, owing to the constitution and the habit of *Callorhinus*, for this remarkable restriction in the Northern Hemisphere compared with its expansion to the south. It is, however, very singular, even in the light of all we know, that right on the equator itself, a trifle to the southward of it, viz, on the Galapagos Islands, fur seals are still found where they were first found a hundred years ago.

The remarkable discrepancy which we have alluded to, may be better understood when we consider that these animals require certain conditions of landing, breeding ground, and climate, all combined, for their perfect life and reproduction. In the North Atlantic no suitable ground for their reception exists or ever did exist; and really nothing in the North Pacific, beyond what we have designated in Bering Sea, will answer the requirements of the fur seal. When we look over the Antarctic waters we are surprised at what might have been done, and should have been done, in those southern waters. Hundreds of miles of the finest seal-breeding grounds on the western coast of Patagonia, the beautiful reaches of the Falkland Islands, the great extent of Desolation Island, together with the whole host of smaller islets, where these animals abounded in almost countless numbers when first discovered (and should abound to-day, millions upon millions of them), have been, through nearly a century, the scenes of indiscriminate slaughter, directed by most unscrupulous and most energetic men. It seems well-nigh incredible, but it is true, nevertheless, that for more than fifty years a large fleet, numbering more than sixty sail, and carrying thousands of active men, traversed this coast and circumnavigated every island and islet, annually slaughtering right and left wherever the seal life was found. Ships were laden to the water's edge with the fresh, air-dried, and salted skins, and they were swallowed up in the marts of the world, bringing mere nominal prices—the markets glutted, but the butchery never stopping.

I will pass in brief review the seal grounds of the Southern Hemisphere, taking at the outset those which are peculiar to the waters of the Pacific Ocean. The Galapagos Islands come first to our notice.

This scattered group of small rocks and islets, uninhabited and entirely arid, was fifty years ago resorted to by a very considerable number of these animals, *Arctocephalus australis*, together with many sea lions, *Otaria hookeri*. Great numbers were then taken by those sealers, who found to their sorrow, when the skins were inspected, that they were thin-furred and worthless. A few survivors, however, remain to this day.

Along and off the coast of Chile and Bolivia are the St. Felix, Juan Fernandez, and Masafuera islands, the latter place being one of the most celebrated rookeries known to southern sealers. The west coast of Patagonia and a portion of that of Terra del Fuego was in those early days of seal hunting, and is to-day, the finest connected range of seal-rookery ground in the south. Here was annually made the concentrated attack of that sealing fleet above referred to; and one can readily understand how thorough must have been its labor, as he studies the great extent and deep indentation of this coast, its thousand and one islands and islets, and when he knows to-day that there is scarcely a bunch of fur seals known to exist there. The Falkland Islands, just abreast of the Straits of Magellan, were also celebrated and a favorite resort, not only of the sealers, but for the whale fleets of the world. They are recorded, in the brief mention made by the best authority, as fairly swarming with fur seals when they were opened up by Captain Cook. There are to-day, in the place of the hundreds of thousands that once existed, an insignificant number, taken notice of only now and then.

The Georgia Islands and the Sandwich group, all a succession of rocky islands and reefs awash—the South Orkneys, the Shetlands, the Auckland group, Campbell Island, Emerald Island, and a few islets lying just to the southward of New Zealand—have all been places of lively and continued butchery, the fur seals ranging in desperation from one of those places to the other as the seasons progressed and the merciless search and slaughter continued. These pinnipeds, however, never went to the southward of 62 degrees south latitude.

In considering these regions of the Antarctic I must not forget also to mention that the fur seal was in early times up the east coast of South America, here and there, in little rookeries, as far north as Cape St. Roque; but the number was unimportant when brought into contrast with that belonging to those localities which we have designated. A small cliff-bound rookery to-day exists at Cape Corrientes. This is owned and farmed out by Argentina, and we are informed that in spite of all their care and attention they have neither increased nor have they diminished from their original insignificance. From these rookeries only 5,000 to 10,000 were and are annually taken. Another small preserve on the Lobos islets, near the mouth of the River Plate, is also protected and leased by the Government of Uruguay, and from 12,000 to 15,000 skins are annually taken there.

When we look at our northern Atlantic waters, we speedily recognize the fact that between North America and Europe, across the Atlantic and into the Arctic, there is not a single island, or islet, or stretch of coast on which the fur seal could successfully struggle for existence; therefore it has never been found there. It appears as if our fur seals had originally passed to Bering Sea from the parent stock of the Patagonia region, up along the coast of South America, a few tarrying at the dry and heated Galapagos Islands, the rest speeding on to the northward, disturbed by the clear skies and sandy beaches of the Mexican Coast, on and up to the great fish-spawning shores of the Aleutian Islands and Bering Sea. There, on the Pribilov group and the bluffy Commander Islands, they found that union of cool water, well-adapted

landing, and moist, foggy air which they had missed since they left the storm-beaten coasts far below.

In the Antarctic waters of the Eastern Hemisphere seals were found at Tristan da Acunha, principally on Little Nightingale Island; the Crozets group, all small rocks, as it were, over which violent storms fairly swept; then we observe the great rookeries of Prince Edward's Group and Desolation Island—where perhaps nine-tenths of all the oriental fur seals congregated—thence over to a small and insignificant islet known as the Royal Company, south of Good Hope. This list includes all the known resting places of the fur seal in those waters.

In the North Pacific, during prehistoric times, a legend from Spanish authority states that fur seals were numerous or abundant on the Santa Barbara and Guadaloupe islands, off the coast of California and the peninsula to the southward. A few were annually taken from these islands up to 1835, and irregularly found there until 1874, an interregnum of some ten years: and, a few hundred skins were taken from there in 1885. None have been secured since. Also, fur seals were wont to sport and rest on those celebrated rocks off the harbor of San Francisco known as the Farralones; but, no tradition locates a seal rookery anywhere else on the northwest coast, or anywhere else in all Alaska and its islands, save the Pribilov group: while across and down the Asiatic coast, only the Commander Islands and a little rocky islet known as Robbens Reef (right under the lee of Sakhalen Island, Okotsk Sea) are known as the resort of this animal. The crafty savages of that entire region, the hairy Aino, and the Japanese themselves have searched in vain during the last hundred years for other ground frequented by these fur seals.

In the light of the foregoing remarks is it not natural, when we reflect upon the immense area and the exceedingly favored conditions of climate and ground frequented by the fur seals of the Southern Ocean, to say that their number must have been infinitely greater as they were first apprehended, surpassing all adequate description, when compared to those which we did regard as the marvel and wonder of our age—the breeding rookeries of the Pribilov group?

It is a great pity that this work of extermination in the Antarctic and senseless destruction should have progressed, as it has, to the very verge of total extinction, ere anyone was qualified to take note of and record the wonderful life thus eliminated. The Falkland Islands and the Shetlands at least might have been placed under the same restrictions and wholesome direction which the Russians established in the north seas, the benefits of which accrue to us until now, and will forever, if the evils now rampant are at once remedied. Certainly it is surprising that the business thought, the hardheaded sense, of those early English navigators should not have been equal to that of the Russian Promyshleniks, who were renowned as the most unscrupulous and the greediest of gain getters.

The Antarctic islands offered natural advantages of protection by land far superior to those found on the Pribilov or Commander groups. They had harbors and they laid outside of the track of commerce: advantages which are not all shared by our islands. At Desolation Island perhaps the difficulties were insuperable on account of the great extent of coast, which is practically inaccessible to man and nearly so to the seals; but the South Shetlands might have been farmed out by the British Government at a trifling outlay and with exceedingly good results, for millions upon millions of the fur seals could rest there to-day, as they did a hundred years ago, and be there to-morrow, as our seals do and are in Bering Sea. But the work is done. There is nothing

down there now valuable enough to rouse the interest of any government. Still, a beginning might be made which possibly fifteen or twenty years hence would rehabilitate the scourged and desolated breeding ground of the south seas. We are selfish people, however, and look only to the present, and it is without question more than likely that should any such proposition be brought before the British Parliament it would be so ridiculed and exaggerated by unthinking men as to cause its speedy suppression.

Now, we are brought in this season of 1890 face to face with the same danger on our own preserves which has destroyed these interests in the Antarctic. Shall we be equal to the occasion, or, shall it be said that they, too, have been ruined by human greed?

THE ROOKERIES OR BREEDING GROUNDS OF THE FUR SEAL ON THE PRIBILOV ISLANDS.

The breeding grounds or rookeries of the Pribilov Islands have altered very slightly insofar as their topographical features are concerned since the date of my last survey of them in 1874; but a marked change in the numbers of the fur seals that then repaired to these grounds, has taken place.

On St. Paul Island, in 1872, we saw the breeding herds of the fur seal in the following form and numbers, contrasted with the figures of to-day, which are made in precisely the same time and method as those of 1872–1874 were:

Analysis of the breeding grounds of the fur seal on St. Paul Island (Pribilov group).

AS SURVEYED, SEASONS OF 1872-1874.

Rookeries.	Sea margin.	Average depth solid massing.	Square feet.	Number of seals (bulls, cows, and pups).
	Feet.	*Feet.*		
July 10, 1872, July 15, 1874, Reef had	4,016	150	602,000	301,000
July 10, 1872, July 15, 1874, Garbotch had	3,660	100	366,000	183,000
July 10, 1872, July 16, 1874, Lagoon had	750	100	750,000	37,000
July 10, 1872, Nah Speel had	400	40	16,000	8,000
July 15, 1872, July 19, 1874, Lukannon had	2,270	150	340,000	170,000
July 14, 1872, July 19, 1874, Ketavie had	2,200	150	330,000	165,000
July 15, 1872, July 6, 1874, Tolstoi had	3,000	150	450,000	225,000
July 16, 1872, July 16, 1874:				
Upper Zapadnie had	2,680	73½	195,600	97,800
Lower Zapadine had	3,200	215½	690,000	345,000
July 17, 1872, July 18, 1874, Polavina, including Little Polavina, had	4,000	150	600,000	300,000
July 18, 1872, July 18, 1874, Novastoshnah had	15,840	150	2,400,000	1,200,000
Grand sum total, season of 1872				3,030,000

AS SURVEYED, SEASON OF 1890.

July 10, 1890, Reef has	4,300	65½	281,000	140,500
July 10, 1890, Garbotch has	2,400	70¾	169,604	84,802
July 14, 1890, Lagoon has	1,500	12	18,000	9,000
July 14, 1890, Nah Speel*				
July 11, 1890, Lukannon has	2,050	60½	145,000	72,500
July 11, 1890, Ketavie has	1,700	34	56,000	28,000
July 11, 1890, Tolstoi has	2,800	44½	124,800	62,400
July 12, 1890:				
Upper Zapadnie has	4,500	15¾	70,000	35,500
Lower Zapadnie has	2,700	63½	175,410	85,705
July 13, 1890, Polavina, including Little Polavina has	2,255	121½	284,500	142,250
July 13, 1890, Novastoshnah has	11,435	37¾	435,750	217,875
Grand sum total, season of 1890				878,532

* Has disappeared.

Season of 1872	3,030,000
Season of 1890	878,532
Showing a loss since 1872 on the rookeries of St. Paul of	2,151,468

Without explanation I may be considered as making use of paradoxical language by using these terms of description: for the inconsistency of talking of "pups" and "cows" and "bulls" and "rookeries," on the breeding grounds of the same, can not fail to be noticed; but this nomenclature has been given and used by the American and English whaling and sealing parties for many years, and the characteristic features of the seals themselves so suit the naming that I have felt satisfied to retain the style throughout as rendering my description more intelligible, especially so to those who are engaged in the business, or may be hereafter. The Russians are more consistent, but not so "pat." They call the "bull" "see-catch," a term implying strength, vigor, etc.; the cow, "matkah," or mother; the pups, "kotickie," or little seals; the nonbreeding males under 4 years, "holluschickie," or bachelors, and the young bulls between 4 and 6 years, "pol seacatchie," or "half bulls." The name applied collectively to the fur seal by them is "morskie-kot," or sea cat.

The rookeries of St. George Island have suffered also, but not to so great an extent: only half of their number of 1873–1874 is missing as we view them this summer. The following statement tells the story:

Analysis of the breeding grounds of the fur seal on St. George Island (Pribilov group).

AS SURVEYED, SEASONS OF 1872–1874.

Rookeries.	Sea margin.	Average depth solid massing.	Square feet.	Number of seals (bulls, cows, and pups).
	Feet.	*Feet.*		
July 12 1873, July 10, 1874, Zapadnie had	600	60	36,000	18,000
July 12. 1873, July 10, 1874, Starry Arteel had	506	125	60.840	30,420
July 13, 1873, July 11, 1874, North had	750 2,000	150 20	112,500 40,000	76.250
July 13, 1873, July 11, 1874, Little East had	200 550	100 10	20,000 5,500	12,750
July 13, 1873, July 11, 1874, East had	200 700	200 15	40,000 10,500	25,250
Grand sum total of 1873				162,670

AS SURVEYED, SEASON OF 1890.

July 20, 1890, Zapadnie had	1,250	20	25,000	12,500
July 20, 1890, Starry Arteel had	800	40	32,000	16,000
July 19, 1890, North had	2,066 1,300	31 10	64,046 13,000	38,523
July 20, 1890, Little East had	800	12	9,600	4.800
July 20, 1890, East had	200 2,040 1,000	30 5 [1]2	6,000 10,200 2,000	9,100
Grand sum total of 1890				80.923

[1] Allowed.

Season of 1873	162,670
Season of 1890	80,923
Showing a loss since 1873 of the rookeries of St. George of	81,747

In the light of the foregoing tables, it will be seen that during 1872–1874 the rookeries of St. Paul and St. George carried 3,192,670 breeding fur seals and their young; that sixteen years later only 959,455 breeding seals and their young can be honestly said to exist thereon.

Great as this loss is, yet it is faint in comparison with that sustained on the hauling grounds as we find matters to-day—there, not even hundreds can be seen now, where we saw thousands sixteen years ago! The young male seals have been directly between the drive, club, and

pelagic hunter since 1882, while the females have had but one direct attack outside of natural causes; they have been, however, the chief quarry of the pelagic sealer during the last five years. The slow elimination of that surplus young male life which was and is necessary for the continued support of these rookeries, and its abrupt curtailment entirely during the last two seasons, coupled with the deadly work of the open-sea hunter throughout the last five years, brings these renowned fields of fur-seal life into immediate danger of speedy extermination as matters are to-day. In order that the full gravity of this statement may be appreciated, I deem it proper that the several steps should be retaken which I took in 1872–1874 toward the determination of that number of seals I recorded then as existing on the Pribilov rookeries. I said then in my published monograph under this particular head:[1]

AUTHOR'S PLAN OF COMPUTATION IN 1872–1874.

"Before I can intelligently and clearly present an accurate estimate of the aggregate number of fur seals which appear upon those great breeding grounds of the Pribilov group every season, I must take up in regular sequence my surveys of these remarkable rookeries which I have illustrated in this memoir by the accompanying sketch maps, showing topographically the superficial area and distribution assumed by the seal life at each locality.

"It will be observed that the sum total on St. Paul Island preponderates and completely overshadows that which is represented at St. George. Before passing to the detailed discussion of each rookery, it is well to call attention to a few salient features in regard to the present appearance of the seals on these breeding grounds, which latter are of their own selection. Touching the location of the fur seals to-day, as I have recorded and surveyed it, compared with their distribution in early times, I am sorry to say that *there is not a single line on a chart, or a word printed in a book, or a note made in manuscript, which refers to this all-important subject prior to my own work*, which I present herewith for the first time to the public. The absence of definite information in regard to what I conceive to be of vital interest and importance to the whole business astonished me; I could not at first believe it, and for the last four or five years I have been searching among the archives of the old Russian company, as I searched diligently when up there and elsewhere in the Territory of Alaska, for some evidence in contradiction of this statement which I have just made. I wanted to find—I hoped to discover—some old record, some clue, by which I could measure with authority and entire satisfaction to my own mind the relative volume of seal life in the past, as compared with that which I record in the present: but, was disappointed.

"I am unable, throughout the whole of the following discussion, to cite a single reliable statement which can give any idea as to the condition and numbers of the fur seal on these islands when they were discovered in 1786–87, or during the whole time of their occupation since, up to the date of my arrival. I mark this so conspicuously, for it is certainly a very strange oversight: a kind of neglect, which, in my opinion, has been, to say the least, inexcusable.

RUSSIAN RECORDS.

"In attempting to form an approximate conception of what the seals were or might have been in those early days, as they spread themselves

[1] Pages 48–50, Monograph, Seal Islands (Census ed. 1881).

over the hauling and breeding grounds of these remarkable islands, I have been thrown entirely upon the vague statements given to me by the natives, and one or two of the first American sealers on the islands. The only Russian record which touches ever so lightly upon the subject[1] contains the remarkable statement, which is, in the light of my surveys, simply ridiculous now—that is, that the number of fur seals on St. George during the first years of Russian occupation was nearly as great as that on St. Paul. The most superficial examination of the physical character of the coasts portrayed on the accompanying maps of those islands, will satisfy any unprejudiced mind as to the total error of such a statement. Why, a mere tithe only of the multitudes which repair to St. Paul in perfect comfort over the 16 to 20 miles of splendid landing ground found thereon, could visit St. George, when all of the coast line fit for their reception at this island is a scant 2½ miles; but for that matter, there was, at the time of my arrival and in the beginning of my investigation, a score of equally wild and incredible legends afloat in regard to the rookeries on St. Paul and St. George. Finding, therefore, that the whole work must be undertaken *de novo*, I set about it without further delay.

"Thus it will be seen that there is, frankly stated, nothing to guide us to a fair or even approximate estimate as to the number of the fur seals on these two islands prior to my labor.

MANNER OF COMPUTING THE NUMBER OF SEALS.

"After a careful study of the subject during three entire consecutive seasons, and a confirmatory review of it in 1876, I feel confident that the following figures and surveys will, upon their own face, speak authoritatively as to their truthful character.

"At the close of my investigation, during the first season of my labor on the grounds, in 1872, the fact became evident that the breeding seals obeyed implicitly an imperative and instinctive natural law of distribution—a law recognized by each and every fur seal upon the rookeries, prompted by a fine consciousness of necessity for its own well-being. The breeding grounds occupied by them were, therefore, invariably covered by the seals in exact ratio, greater or less, as the area upon which they rested was larger or smaller. They always covered the

[1] Veniaminov: Zapieskie ob Oonalashkenskaho Otdayla, 2 vols., St. Petersburg, 1842. This work of Bishop Innocent Veniaminov is the only one which the Russians can lay claim to as exhibiting anything like a history of western Alaska, or of giving a sketch of its inhabitants and resources that has the least merit of truth or the faintest stamp of reliability. Without it we should be simply in the dark as to much of what the Russians were about during the whole period of their occupation and possession of that country. He served, chiefly as a priest and missionary, for twenty-five years, from 1814 to 1839, at Unalaska, having the seal islands in his parish, and was made bishop of all Alaska. He was soon after recalled to Russia, where he became the primate of the national church, ranking second to no man in the Empire, save the Czar. He must have been a man of fine personal appearance, judging from the following description of him, noted by Sir George Simpson, who met him at Sitka in 1842, just as he was about to embark for Russia: "His appearance, to which I have already alluded, impresses a stranger with something of awe, while in further intercourse, the gentleness which characterizes his every word and deed insensibly molds reverence into love; and, at the same time, his talents and attainments are such as to be worthy of his exalted station. With all this, the bishop is sufficiently a man of the world to disdain anything like cant. His conversation, on the contrary, teems with amusement and instruction, and his company is much prized by all who have the honor of his acquaintance." Such is the portrait drawn of him by a governor of the Hudson Bay Company. At the advanced age of 93 years this much beloved and esteemed prelate died, in Moscow, April 22, 1879.

ground evenly, never crowding in at one place here to scatter out there. The seals lie just as thickly together where the rookery is boundless in its eligible area to their rear and unoccupied by them, as they do in the little strips which are abruptly cut off and narrowed by rocky walls behind. For instance, on a narrow rod of ground under the face of bluffs which hem it back as land from the sea there are just as many seals, no more and no less, as will be found on any other rod of rookery ground throughout the whole list, great and small; *always exactly so many seals, under any and all circumstances, to a given area of breeding ground.* There are just as many cows, bulls, and pups on a square rod at Nah Speel, near the village, where, in 1874, all told, there were only 7,000 or 8,000, as there are on any square rod at Northeast Point, where a million of them congregate.

"This fact being determined, *it is evident that just in proportion as the breeding grounds of the fur seal on these islands expand or contract in area from their present dimensions the seals will increase or diminish in number.*

"My discovery, at the close of the season of 1872, of this law of distribution, gave me at once the clue I was searching for in order to take steps by which I could arrive at a sound conclusion as to the entire number of seals herding on the island.

"I noticed, and time has confirmed my observation, that the period for taking these boundaries of the rookeries so as to show this exact margin of expansion at the week of its greatest volume, or when they are as full as they are to be for the season, is between the 10th and 20th of July of every year—not a day earlier, and not many days later. After the 20th of July the regular system of compact, even organization breaks up. The seals then scatter out in pods or clusters, the pups leading the way, straying far back—the same number instantly covering twice and thrice as much ground as they did the day or week before, when they lay in solid masses and were marshaled on the rookery ground proper.

"There is no more difficulty in surveying these seal margins during this week or ten days in July than there is in drawing sights along and around the curbs of a stone fence surrounding a field. The breeding seals remain perfectly quiet under your eyes all over the rookery, and almost within your touch, everywhere on the outside of their territory that you may stand or walk. The margins of massed life, as I have indicated on the topographical surveys of these breeding grounds of St. Paul and St. George, are as clean cut and as well defined against the soil and vegetation as is the shading on my maps. There is not the least difficulty in making the surveys, and in making them correctly.

"Now, with a knowledge of the superficial area of these breeding grounds, the way is clearly open to a very interesting calculation as to the number of fur seals upon them. I am well aware of the fact when I enter upon this discussion that I can not claim perfect accuracy: but, as shadowing my plan of thought and method of computation, I propose to present every step in the processes which have guided me to the result.

ROOKERY SPACE OCCUPIED BY SINGLE SEALS.

"When the adult males and females, fifteen or twenty of the latter to every one of the former, have arrived upon the rookery, I think an area *a little less than 2 feet square* for each female may be considered as the superficial space required by each animal with regard to its size and in

obedience to its habits; and this limit may safely be said to be over the mark. Now, *every female or cow on this 2 feet square of space doubles herself* by bringing forth her young; and in a few days or a week perhaps, after its birth, the cow takes to the water to wash and feed, and is not back on this allotted space one-half of the time again during the season. *In this way, is it not clear that the females almost double their number on the rookery grounds without causing the expansion of the same beyond the limits that would be actually required did they not bear any young at all?* For every 100,000 breeding seals there will be found more than 85,000 females and less than 15,000 males; and in a few weeks after the landing of these females they will show for themselves—that is, for this 100,000—fully 180,000 males, females, and young instead, *on the same area of ground occupied previously to the birth of the pups.*

"It must be borne in mind that perhaps 10 or 12 per cent of the entire number of females were yearlings last season and come up on to these breeding grounds as nubiles for the first time during this season—as two-year-old cows; they of course bear no young. The males, being treble and quadruple the physical bulk of the females, require about four feet square for their use of this same rookery ground: but, as they are less than one-fifteenth the number of the females, much less in fact, they therefore occupy only one-eighth of the space over the breeding ground, where we have located the supposed 100,000. This surplus area of the males is also more than balanced and equalized by the 15,000 or 20,000 two-year-old females which come on to this ground for the first time to meet the males. They come: rest a few days or a week and retire, leaving no young to show their presence on the ground.

"The breeding bulls average 10 feet apart by 7 feet on the rookery ground; have each a space therefore of about 70 square feet for an average family of 15 cows, 15 pups, and 5 virgin females, or 35 animals for the 70 feet—*2 square feet for each seal, big or little.* The virgin females do not lay out long and the cows come and go at intervals, never all being on this ground at one time, as the bull has plenty of room in his space of 70 square feet for himself and harem.

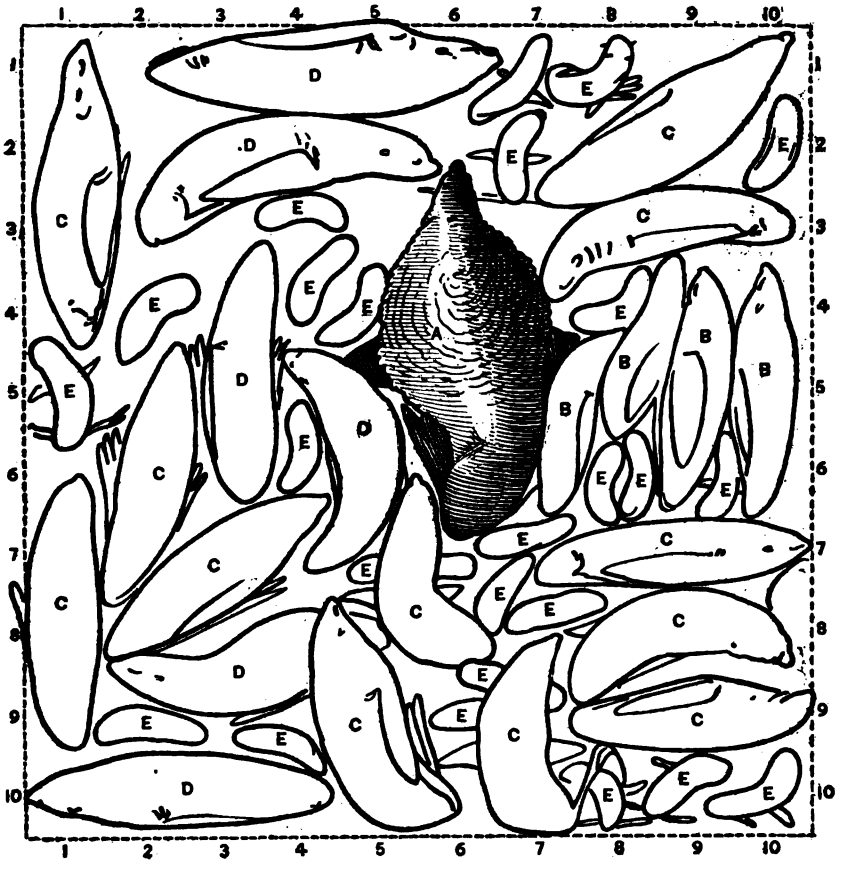
"Taking all these points into consideration, and they are features of fact, I quite safely calculate upon *an average of 2 square feet to every animal, big or little, on the breeding grounds* as the initial point upon which to base an intelligent computation of the entire number of seals before us. Without following this system of enumeration, a person may look over these swarming myriads between Southwest Point and Novastoshnah, guessing vaguely and wildly at any figure from 1,000,000 up to 10,000,000 or 12,000,000, as has been done repeatedly. How few people know what a million really is! it is very easy to talk of a million, but it is a tedious task to count it off, and makes one's statements as to 'millions' decidedly more conservative after the labor has been accomplished."

[Transcript from the author's field notes of 1874.]

NAH SPEELKIE, *St. Paul Island, July 12.*

I am satisfied to-day that the pups are the sure guide to the whole number of seals on the rookeries. The mother seals are constantly coming and going, while the pups never leave the spot upon which they are dropped, more than a few feet in any direction until the rutting season ends; then they are allowed, with their mothers, by the old bulls to scatter over all the ground they want to. At this date the compact system of organization and massing on the breeding grounds is solidly maintained by the bulls; it is not relaxed in the least until on and after July 20.

This study of the breeding seals was made from the summit of a low bluff which rose perpendicularly back of and overhung these seals as depicted, and several thousand more on either side right and left, and beyond them down to the sea. The portions of the bodies of those seals which lay inside of the lines of this square, are not indicated; they belong to the adjoining harems.



ORIGINAL FIELD DIAGRAM.

Diagram of a section of "Nah Speel" breeding ground, showing the relative area and numbers of fur seals thereon as they appear massed uniformly all over the entire breeding area of the Pribilov Islands between July 10 and 20, at the height of the breeding or rutting season.

Scale one-half inch to the foot, showing exactly 100 square feet of superficial area, on which 18 breeding females (primipares, C, multipares, D); 4 virgin females (nubiles, B); 24 newly born pups (E), and 1 old bull or sea catch (A), laid under my eye July 12, 1874, showing the presence of 47 seals, big and little on this area, not at all uncomfortably crowded. The number of pups to the superficial area of the breeding ground, between July 10 and 20, is the surest guide to a correct calculation of the number of mothers, since it is seldom that more than one-half, generally only one-third, of the mothers are present at any one time. Six mothers are apparently absent in the above diagram; but they really never are all on this ground at any one time; more here to-day than usual.

The following statements of fact as to this matter of the numbers of the breeding seals, as introductory, are pertinent:[1]

First. No fur seals except the females (nubiles, primipares, and multipares) and their young, and the full-grown males, are found upon the breeding grounds during the rutting season; emphatically none at the height of this season in July every year.

Second. The proportion of females to males in 1872-1874 was an average of 15 bearing females, and their 15 young, newly born; and of nubiles or virgin females (or those coming into heat for the first time), an indefinite number, because they leave no evidence of their being on the ground by pupping. I believe that four or five of these young females to each male in 1872-1874 was a fair average.

If the reader will bear these two leading statements steadily in mind, as he follows my explanation below, he will not get my argument mixed up with the size and weight of the bachelor seals, or nonbreeding males that never came upon these rookeries in 1872-1874, during the breeding season aforesaid.

Now for the physical fur-seal data:

Typical examples of fur seals.	Average length.	Weight.
	*Inches.**	*Pounds.*
A nubile female	45	58 to 60
An old female	48	75 to 100
A newly-born (two weeks old)	14	10 to 11
Full grown bull or male	75	300 to 400

* From tip of nose to root of tail; tail very short, never more than 2 to 4 inches in length.

These figures are from a large series of measurements which I made on the killing grounds of the Pribilov Islands in 1872-1874, inclusive, and they can not be impeached.

Therefore, the reader will observe that a female seal is not quite 4 feet in length: her greatest diameter is at her shoulders (where her girth is from 28 to 32 inches), from 10 to 12 inches, the body then tapering rapidly from thence to both ends, anterior and posterior.

That a puppy seal from one to three weeks old (and when my estimates were made) is a scant foot in length, with its greater body diameter not more than 5 inches—really not more than a full 4 inches in most cases.

That a full-grown bull fur seal is between 6 and 7 feet in length, with an average of 6½ feet, for the entire rookery; that its greatest body diameter, through its shoulders and under its "wig," is an average of 2½ feet, tapering rapidly from here to the tip of nose and root of tail.

These statements of fact being understood, now I ask the reader to note the following:

No fur seal, young or old, when resting on the breeding grounds stretches itself out at full length on the rocks or earth unless injured in the lumbar regions, or deathly sick: and, the number you can see in this condition, you can count on your fingers at the end of every day's close observation of hundreds of thousands.

The female fur seals and their young take three typical positions when hauled out on the breeding grounds, as shown in figs. 1, 2, and 3; while the pups add a fourth position assumed by curling themselves up so as to form a round ball, as in fig. 4; and the adult males take relatively the same positions of the females above indicated; but, owing to the great fatigue that ensues from fighting among themselves and serving the females, they sprawl out at intervals in almost every conceivable form except that of stretching themselves out at full length. All fur seals when at rest invariably throw their hindquarters up under their loins, just as a dog or cat does; in the case of the hair seals, it is the reverse. Now, understanding those points, the reader will please take a survey of the following diagrams, which show a female seal outlined as she rests on 4 square feet of ground and her pup as it lies by her.[2]

The following diagram shows the superficial area covered by a "bull" as it rests so as to cover the greatest space in any one posture that it naturally assumes.

[1] These detailed and expanded statements as to my method of calculating the numbers of fur seals in 1872-1874 were published in *Forest and Stream*, November 19, 1891, New York, pp. 347, 348. They were rendered necessary to meet the baseless criticism of a self constituted authority who pretended to know a great deal about the subject before the Biological Society of Washington, October 17, 1891, but who, in fact, knew nothing.—[Author, January 30, 1895, Washington, D. C.]

[2] In my Census *Monograph of the Seal Islands* (Tenth Census, U. S. A., 1881), on page 50, is an error in the types, where I am made to say that a female fur seal requires "an area a little less than 2 square feet." This is self-evident nonsense not due to me, because on page 77 of my official report on this subject in 1874 (*Condition of affairs in Alaska*, Washington, 1875), the same sentence is correctly printed as a space "a little less than 2 feet square." The printer had my printed pages of 1875 to copy in the Census Monograph, and I did not detect the error at the time of issue, and really did not observe it until 1891.

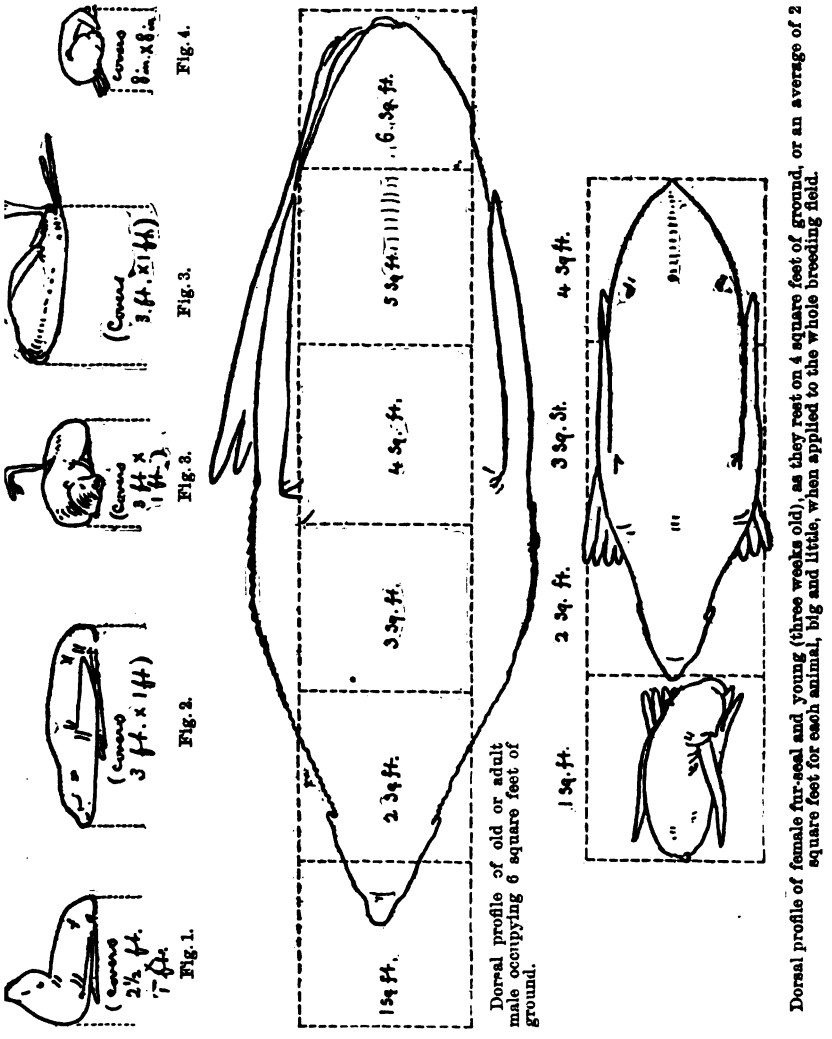


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
1 sq. ft.
2 sq. ft.
3 sq. ft.
4 sq. ft.
5 sq. ft.
6 sq. ft.
Dorsal profile of old or adult male occupying 6 square feet of ground.
1 sq. ft.
2 sq. ft.
3 sq. ft.
4 sq. ft.
Dorsal profile of female fur-seal and young (three weeks old), as they rest on 4 square feet of ground, or an average of 2 square feet for each animal, big and little, when applied to the whole breeding field.

Now, is it not entirely plain that the females as they rest on the breeding grounds, require but 3 square feet of surface; that their pups require a trifle less than 1 square foot each, and that the bulls or adult males occupy little more than 8 or 10 square feet? But, right at this point, you may reasonably ask, "While it is clear that 4 square feet of area will embrace a female fur seal and her offspring, yet why do you ignore that larger space which you admit the bull occupies?"

For this reason: I have not been able to fix upon the number of virgin females which have been upon this breeding ground during the rutting season, for the reason that these females naturally leave no mark behind them of their being here, as the other classes of females do, and they do not remain themselves long on the field after being served; so, it was reasonable to give each bull an average of at least four of these nubiles, at the lowest calculation. This would cover the ground which he occupies, and reduces the whole basis of calculation to the simplest form, viz, 2 square feet for each animal, big and little—bulls, cows, and pups—that existed on those breeding grounds as these animals hauled out and bred in 1872–1874.

Everybody admitted in 1872–1874, who was on the islands and especially charged with observing the seals, that I was right in then saying that the seals obeyed a natural law of distribution over a given area of ground when breeding; that they never crowded here or thinned out there; that the ground was densely occupied and uniformly, no matter whether only a belt under the cliffs or where the rookery ground extended for hundreds of feet away back from the sea margin.

The dense massing of the seals on the rookery ground was then made evident to the most careless observer when his attention was fixed on the subject. It was made by the appearance of the pups themselves, which, between the 10th and 20th of July every year, lay in so solidly together that the ground itself seemed fairly covered by them alone, since not more than one-third of the mothers were on shore among the pups at any one time.

Before summing up the grand total, I shall now, in sequence, review each one of the several rookeries of St. Paul, taking them in their order as they occur, going north from the Reef point. The accompanying maps show the exact area occupied by the breeding seals and their young in the season of 1874, which is the date of my latest field work on the Pribilov Islands up to this year.

I may add that my method of surveying these breeding grounds in 1872–1874 was by means of measured base lines, taking my angles and cross bearings with an azimuth compass. In 1890, I used a fine prismatic compass; otherwise, precisely the same method was again employed. I made a careful land survey of each rookery on St. Paul Island between May 22 and June 4, so that when the females all arrived by July 10, I was able to then go out upon each one of these rookeries with my finished plat of the land in hand: and, upon it, in the field, again plat the massing of the breeding animals as they exhibited themselves, without a moment's delay, so as to properly and deliberately finish the entire work before the rutting season was over by July 20. By this time those rookeries are scattering and scattered, as they always are by the lapse of that period, since the old bulls then relax their absolute control of their harems and permit all classes to wander at will.

In this connection it is pleasant for me to say now, that in 1874 I was accompanied by Lieut. Washburn Maynard, U. S. N., who, being also a trained topographer, aided me in verifying my surveys of 1872–73. He gave this subject close attention. He appreciated its importance, and in his published report to the Secretary of the Navy in 1875, he uses the following language:

It is of very great significance in this connection to know how many seals come annually to the islands, or rather to understand how many may be killed for their skins annually, without causing less to come hereafter than do at the present time. To determine how many there are with accuracy is a task almost on a par with that of numbering the stars. The singular motion of the animals when on shore, the great variety in size, color, and position; the extent of surface over which they are spread, and the fact that it can not be determined exactly what proportion of them of their several classes are on shore at any given time; all these desiderata for comprehension make it simply impossible to get more than an approximation of their numbers. They have been variously estimated at from one to fifteen millions.

I think the most accurate enumeration yet made is that by Mr. H. W. Elliott,

special agent of the Treasury Department, in 1872. This calculation is based upon the hypothesis that the breeding seals are governed in hauling by a common and invariable law of distribution, which is that the area of the rookery ground is directly proportional to the number of seals occupying it. He estimates that there is one seal to every 2 square feet of rookery surface. Hence the problem is reduced to the simple operation of obtaining half the sum of the superficial area of all the rookeries in square feet. He surveyed these breeding grounds of both islands in 1872 and 1873, when at their greatest limit of expansion, and obtained the following results: Upon St. Paul Island there were 6,060,000 feet of ground, occupied by 3,030,000 breeding seals and their young. On St. George Island he announced 326,840 square feet of superficial rookery area, occupied by 163,420 breeding seals and their young; a total for both islands of 3,193,420 breeding seals, and their young. The number of nonbreeding seals can not be determined in the foregoing manner, as they haul most irregularly, but it seems to me probable that they are nearly as numerous as the other class. If so, it would give not far from 6,000,000 as the stated number of seals of all kinds which visited the Pribilov Islands during the season of 1872.

It is likely that these figures are not far from the truth, but I do not think it necessary myself to take into consideration the actual number of seals in order to decide the question of how many can be taken each year without injury to the fishery. The law that the size of the rookeries varies directly as the number of seals increases or diminishes seems to me, after close and repeated observation, to be correct. All the rookeries, whether large or small, are uniform in appearance, alike compact, without waste of space, and never crowded. Such being the case, it is unimportant to know the actual number of seals upon the rookeries. For any change in the number of seals, which is the point at issue, increases or decreases in size, and the rookeries, taken collectively, will show a corresponding increase or decrease in the number of breeding seals; consequently, changes in the aggregate of pups born annually, upon which the extent and safety of the fisheries depend, can be observed accurately from year to year by following these lines of survey.

If, then, a plan or map of each rookery be made every year, showing accurately its size and form when at its greatest expansion, which is between the 10th and 25th of July, annually, a comparison of this map will give the relative number of the breeding seals as they increase or diminish from year to year. I submit with this report maps of St. Paul and St. George islands, showing the extended location of breeding rookeries and hauling grounds upon them. These maps are from surveys made in July, 1874, by Mr. Elliott and myself, and a map of each rookery on both islands drawn from careful surveys made by Mr. Elliott in 1872, show them now as they were in the season of 1874 as compared with that of 1872. I respectfully recommend that enlarged copies of these latter maps be furnished to the Government agents in charge of the islands, and that they be required to compare them each year with the respective rookeries, and note what change in size and form, if any, exists upon them. This, if carefully done, will afford data after a time, by which the seal fisheries can be regulated with comparative certainty, so as to produce the greatest revenue to the Government without injury to this valuable interest. (Forty-fourth Congress, first session, House Ex. Doc. No. 43, pp. 4, 5.)

This finished work of 1872–1874 I reproduce in the following maps of the several rookeries of St. Paul Island, and add the hauling grounds of St. George Island to the original survey of 1874. The smallness of the rookeries on the latter island permits this addition to these charts, but the hauling grounds of St. Paul for 1872–1874 can not be drawn upon so small a scale and require a special general map of the entire island itself to properly show them. This map appears under Section II following. The hauling grounds of St. George are so limited in area that a general map of this island to clearly show them would need an immensely enlarged scale. The general position, however, of the St. George rookeries and hauling grounds is clearly defined on my revised map of St. George Island under the head of Section II.

I pass to a description in detail of each rookery of the Pribilov Islands, giving my first published account of them as they appeared in 1872–1874, and each original description is then supplemented by my notes and surveys of last summer. The accompanying maps are so tinted as to express clearly the status of 1872–1874 as compared with the condition of 1890.[1]

[1] This combination of the work of 1872–1874 and 1890 upon one chart of each rookery is much better and more satisfactory than to publish the original survey by itself, with a duplicate series of charts for 1890.

THE REEF ROOKERY (1872-1874).

[*Its condition and appearance July, 1874.*]

By reference, first, to the general map, it will be observed that this large breeding ground, on that grotesquely shaped neck which ends in the Reef Point, is directly contiguous to the village—indeed, it may be fairly said to be right under the lee of the houses on the hill. It is one of the most striking of all the rockeries, owing probably to the fact that on every side it is sharply and clearly exposed to our vision as the circuit is made in boats. A reach of very beautiful, drifting sand a quarter of a mile long, between the village hill and the Reef bluffs separates the breeding grounds proper, from the habitations of the people. These Zoltoi sands are, however, a famous rendezvous for the holluschickie: and, from them, during the season, the natives make regular drives, having only to step out from their houses in the morning and walk but a few rods to find their fur-bearing quarry.

Passing over these sands on our way down to the Point, we quickly come to a basaltic ridge or backbone, over which the sand has been rifted by the winds, and which supports a rank and luxuriant growth of the *Elymus* and other grasses, with beautiful flowers. A few hundred feet farther along our course, brings us in full view, as we look to the south, of one of the most entrancing spectacles which seals afford to man. We look down upon and along a grand promenade ground which slopes gently to the eastward, and trends southward away to the water from those abrupt cliffs bordering the sea on the west, over a parade plateau as smooth as the floor of a ballroom: 2,000 feet in length, from 500 to 1,000 feet in width, over which multitudes of holluschickie are filing in long strings, or deploying in vast platoons, hundreds abreast, in an unceasing march and countermarch! The breath which rises into the cold air from a hundred thousand hot throats hangs like clouds of white steam in the gray fog itself; indeed, it may be said to be a *seal fog* peculiar to the spot, while the din, the roar arising over all, defies our description.

We notice to our right and to our left, the immense solid masses of the breeding seals at Garbotch, and those stretching and trending around nearly a mile from our feet, far around to the Reef Point below and opposite the parade ground, with here and there a neutral passage left open for the holluschickie to go down and come up from the waves.

The adaptation of this ground of the Reef rookery to the requirements of the seal is perfect. It so lies that it falls gently from its high Zoltoi Bay margin on the west to the sea on the east, and upon its broad expanse not a solitary puddle of mud-spotting is to be seen, though everything is reeking with moisture, and the fog even dissolves into rain as we view the scene. Every trace of vegetation upon this parade has been obliterated. A few tufts of grass capping the summits of those rocky hillocks indicated on the eastern and middle slope are the only signs of botanical life which the seals have suffered to remain.

A small rock, Seevitchie Kammin, 800 or 900 feet right to the southward and out at sea, is also covered with the black and yellow forms of fur seals and sea lions. It is environed by shoal reefs, rough and kelp grown, which navigators prudently avoid.

This rookery of the Reef, proper, has 4,016 feet of sea margin an average depth of 150 feet, making ground for 301,000 breeding and their young. Garbotch rookery has 3,660 feet of sea margin an average depth of 100 feet, making ground for 183,000 breeding and their young, an aggregate for this great Reef rookery of 4

over the hauling and breeding grounds of these remarkable islands, I have been thrown entirely upon the vague statements given to me by the natives, and one or two of the first American sealers on the islands. The only Russian record which touches ever so lightly upon the subject[1] contains the remarkable statement, which is, in the light of my surveys, simply ridiculous now—that is, that the number of fur seals on St. George during the first years of Russian occupation was nearly as great as that on St. Paul. The most superficial examination of the physical character of the coasts portrayed on the accompanying maps of those islands, will satisfy any unprejudiced mind as to the total error of such a statement. Why, a mere tithe only of the multitudes which repair to St. Paul in perfect comfort over the 16 to 20 miles of splendid landing ground found thereon, could visit St. George, when all of the coast line fit for their reception at this island is a scant 2½ miles; but for that matter, there was, at the time of my arrival and in the beginning of my investigation, a score of equally wild and incredible legends afloat in regard to the rookeries on St. Paul and St. George. Finding, therefore, that the whole work must be undertaken *de novo*, I set about it without further delay.

"Thus it will be seen that there is, frankly stated, nothing to guide us to a fair or even approximate estimate as to the number of the fur seals on these two islands prior to my labor.

MANNER OF COMPUTING THE NUMBER OF SEALS.

"After a careful study of the subject during three entire consecutive seasons, and a confirmatory review of it in 1876, I feel confident that the following figures and surveys will, upon their own face, speak authoritatively as to their truthful character.

"At the close of my investigation, during the first season of my labor on the grounds, in 1872, the fact became evident that the breeding seals obeyed implicitly an imperative and instinctive natural law of distribution—a law recognized by each and every fur seal upon the rookeries, prompted by a fine consciousness of necessity for its own well-being. The breeding grounds occupied by them were, therefore, invariably covered by the seals in exact ratio, greater or less, as the area upon which they rested was larger or smaller. They always covered the

[1] Veniaminov: Zapieskie ob Oonalashkenskaho Otdayla, 2 vols., St. Petersburg, 1842. This work of Bishop Innocent Veniaminov is the only one which the Russians can lay claim to as exhibiting anything like a history of western Alaska, or of giving a sketch of its inhabitants and resources that has the least merit of truth or the faintest stamp of reliability. Without it we should be simply in the dark as to much of what the Russians were about during the whole period of their occupation and possession of that country. He served, chiefly as a priest and missionary, for twenty-five years, from 1814 to 1839, at Unalaska, having the seal islands in his parish, and was made bishop of all Alaska. He was soon after recalled to Russia, where he became the primate of the national church, ranking second to no man in the Empire, save the Czar. He must have been a man of fine personal appearance, judging from the following description of him, noted by Sir George Simpson, who met him at Sitka in 1842, just as he was about to embark for Russia: "His appearance, to which I have already alluded, impresses a stranger with something of awe, while in further intercourse, the gentleness which characterizes his every word and deed insensibly molds reverence into love; and, at the same time, his talents and attainments are such as to be worthy of his exalted station. With all this, the bishop is sufficiently a man of the world to disdain anything like cant. His conversation, on the contrary, teems with amusement and instruction, and his company is much prized by all who have the honor of his acquaintance." Such is the portrait drawn of him by a governor of the Hudson Bay Company. At the advanced age of 93 years this much beloved and esteemed prelate died, in Moscow, April 22, 1879.

ground evenly, never crowding in at one place here to scatter out there. The seals lie just as thickly together where the rookery is boundless in its eligible area to their rear and unoccupied by them, as they do in the little strips which are abruptly cut off and narrowed by rocky walls behind. For instance, on a narrow rod of ground under the face of bluffs which hem it back as land from the sea there are just as many seals, no more and no less, as will be found on any other rod of rookery ground throughout the whole list, great and small; *always exactly so many seals, under any and all circumstances, to a given area of breeding ground.* There are just as many cows, bulls, and pups on a square rod at Nah Speel, near the village, where, in 1874, all told, there were only 7,000 or 8,000, as there are on any square rod at Northeast Point, where a million of them congregate.

"This fact being determined, *it is evident that just in proportion as the breeding grounds of the fur seal on these islands expand or contract in area from their present dimensions the seals will increase or diminish in number.*

"My discovery, at the close of the season of 1872, of this law of distribution, gave me at once the clue I was searching for in order to take steps by which I could arrive at a sound conclusion as to the entire number of seals herding on the island.

"I noticed, and time has confirmed my observation, that the period for taking these boundaries of the rookeries so as to show this exact margin of expansion at the week of its greatest volume, or when they are as full as they are to be for the season, is between the 10th and 20th of July of every year—not a day earlier, and not many days later. After the 20th of July the regular system of compact, even organization breaks up. The seals then scatter out in pods or clusters, the pups leading the way, straying far back—the same number instantly covering twice and thrice as much ground as they did the day or week before, when they lay in solid masses and were marshaled on the rookery ground proper.

"There is no more difficulty in surveying these seal margins during this week or ten days in July than there is in drawing sights along and around the curbs of a stone fence surrounding a field. The breeding seals remain perfectly quiet under your eyes all over the rookery, and almost within your touch, everywhere on the outside of their territory that you may stand or walk. The margins of massed life, as I have indicated on the topographical surveys of these breeding grounds of St. Paul and St. George, are as clean cut and as well defined against the soil and vegetation as is the shading on my maps. There is not the least difficulty in making the surveys, and in making them correctly.

"Now, with a knowledge of the superficial area of these breeding grounds, the way is clearly open to a very interesting calculation as to the number of fur seals upon them. I am well aware of the fact when I enter upon this discussion that I can not claim perfect accuracy: but, as shadowing my plan of thought and method of computation, I propose to present every step in the processes which have guided me to the result.

ROOKERY SPACE OCCUPIED BY SINGLE SEALS.

"When the adult males and females, fifteen or twenty of the latter to every one of the former, have arrived upon the rookery, I think an area *a little less than 2 feet square* for each female may be considered as the superficial space required by each animal with regard to its size and in

over the hauling and breeding grounds of these r[illegible] to be over the have been thrown entirely upon the vague st[illegible] of space doubles the natives, and one or two of the first Am[illegible] few days or a week The only Russian record which touche[illegible] water to wash and feed, ject[1] contains the remarkable stat[illegible] of the time again dur- surveys, simply ridiculous now [illegible] clear that the females almost St. George during the first [illegible] without causing the expansion great as that on St. Paul. [illegible] actually required did they not cal character of the coa[illegible] 100,000 breeding seals there will be islands, will satisfy ar[illegible] less than 15,000 males; and in a a statement. Why [illegible] females and females they will show for them- to St. Paul in per[illegible] this 100,000—fully 180,000 males, females, and ing ground four[illegible] ground occupied previously to the line fit for th[illegible] that matter [illegible] perhaps 10 or 12 per cent of the entire of my in[illegible] yearlings last season and come up on to these afloat in [illegible] for the first time during this season—as two- therefo[illegible] of course bear no young. The males, being treble it wit[illegible] physical bulk of the females, require about four feet "[illegible] number of females, much less in fact, they us [illegible] only one-eighth of the space over the breeding ground, se[illegible] located the supposed 100,000. This surplus area of the [illegible] balanced and equalized by the 15,000 or 20,000 [illegible] females which come on to this ground for the first time to [illegible] They come: rest a few days or a week and retire, [illegible] show their presence on the ground.

"The breeding bulls average 10 feet apart by 7 feet on the rookery ground; have each a space therefore of about 70 square feet for an average family of 15 cows, 15 pups, and 5 virgin females, or 35 animals for the 70 feet—*2 square feet for each seal, big or little.* The virgin females do not lay out long and the cows come and go at intervals, never all being on this ground at one time, as the bull has plenty of room in his space of 70 square feet for himself and harem.

"Taking all these points into consideration, and they are features of fact, I quite safely calculate upon *an average of 2 square feet to every animal, big or little, on the breeding grounds* as the initial point upon which to base an intelligent computation of the entire number of seals before us. Without following this system of enumeration, a person may look over these swarming myriads between Southwest Point and Novastoshnah, guessing vaguely and wildly at any figure from 1,000,000 up to 10,000,000 or 12,000,000, as has been done repeatedly. How few people know what a million really is! it is very easy to talk of a million, but it is a tedious task to count it off, and makes one's statements as to 'millions' decidedly more conservative after the labor has been accomplished."

[Transcript from the author's field notes of 1874.]

NAH SPEELKIE, *St. Paul Island, July 12.*

I am satisfied to-day that the pups are the sure guide to the whole number of seals on the rookeries. The mother seals are constantly coming and going, while the pups never leave the spot upon which they are dropped, more than a few feet in any direction until the rutting season ends; then they are allowed, with their mothers, by the old bulls to scatter over all the ground they want to. At this date the compact system of organization and massing on the breeding grounds is solidly maintained by the bulls; it is not relaxed in the least until on and after July 20.

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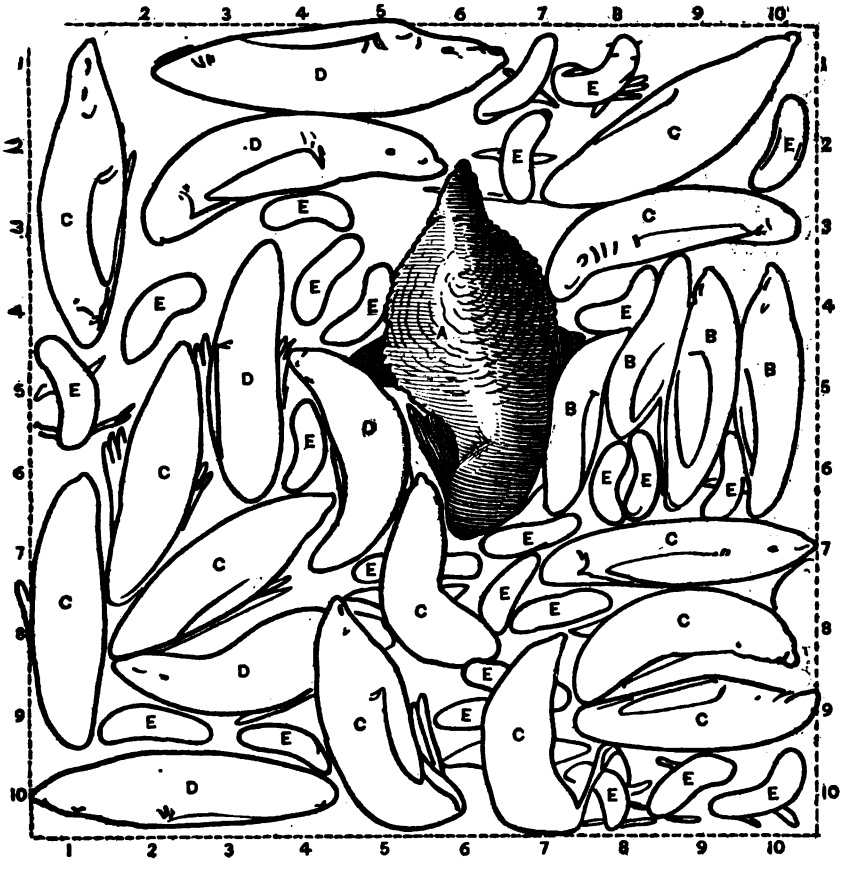

ORIGINAL FIELD DIAGRAM.

Diagram of a section of "Nah Speel" breeding ground, showing the relative area and numbers of fur seals thereon as they appear massed uniformly all over the entire breeding area of the Pribilov Islands between July 10 and 20, at the height of the breeding or rutting season.

Scale one-half inch to the foot, showing exactly 100 square feet of superficial area, on which 18 breeding females (primipares, C, multipares, D); 4 virgin females (nubiles, B); 24 newly born pups (E), and 1 old bull or sea catch (A), laid under my eye July 12, 1874, showing the presence of 47 seals, big and little on this area, not at all uncomfortably crowded. The number of pups to the superficial area of the breeding ground, between July 10 and 20, is the surest guide to a correct calculation of the number of mothers, since it is seldom that more than one-half, generally only one-third, of the mothers are present at any one time. Six mothers are apparently absent in the above diagram; but they really never are all on this ground at any one time; more here to-day than usual.

SECTION I.

THE ROOKERIES OR BREEDING GROUNDS OF THE FUR SEAL ON THE PRIBILOV ISLANDS OF ALASKA; THEIR AREA AND CONDITION IN 1872–1874 AND 1890.

GEOGRAPHICAL DISTRIBUTION OF THE FUR SEAL AND ITS EXTERMINATION IN THE ANTARCTIC.

PECULIARITIES OF DISTRIBUTION.

Our first thought in studying the distribution of the fur seals throughout the high seas of the earth is one of wonder. While they have been so widely spread over the Antarctic regions, yet, as we pass the equator going north, we find in the Atlantic above the tropics nothing that resembles them. Their landed habitat in the North Pacific is virtually confined to four islands in Bering Sea—St. Paul and St. George—of the Pribilov group, and Bering and Copper of the Commander Islands.

It should be observed that there is abundant reason, owing to the constitution and the habit of *Callorhinus*, for this remarkable restriction in the Northern Hemisphere compared with its expansion to the south. It is, however, very singular, even in the light of all we know, that right on the equator itself, a trifle to the southward of it, viz, on the Galapagos Islands, fur seals are still found where they were first found a hundred years ago.

The remarkable discrepancy which we have alluded to, may be better understood when we consider that these animals require certain conditions of landing, breeding ground, and climate, all combined, for their perfect life and reproduction. In the North Atlantic no suitable ground for their reception exists or ever did exist; and really nothing in the North Pacific, beyond what we have designated in Bering Sea, will answer the requirements of the fur seal. When we look over the Antarctic waters we are surprised at what might have been done, and should have been done, in those southern waters. Hundreds of miles of the finest seal-breeding grounds on the western coast of Patagonia, the beautiful reaches of the Falkland Islands, the great extent of Desolation Island, together with the whole host of smaller islets, where these animals abounded in almost countless numbers when first discovered (and should abound to-day, millions upon millions of them), have been, through nearly a century, the scenes of indiscriminate slaughter, directed by most unscrupulous and most energetic men. It seems well-nigh incredible, but it is true, nevertheless, that for more than fifty years a large fleet, numbering more than sixty sail, and carrying thousands of active men, traversed this coast and circumnavigated every island and islet, annually slaughtering right and left wherever the seal life was found. Ships were laden to the water's edge with the fresh, air-dried, and salted skins, and they were swallowed up in the marts of the world, bringing mere nominal prices—the markets glutted, but the butchery never stopping.

I will pass in brief review the seal grounds of the Southern Hemisphere, taking at the outset those which are peculiar to the waters of the Pacific Ocean. The Galapagos Islands come first to our notice.

This scattered group of small rocks and islets, uninhabited and entirely arid, was fifty years ago resorted to by a very considerable number of these animals, *Arctocephalus australis*, together with many sea lions, *Otaria hookeri*. Great numbers were then taken by those sealers, who found to their sorrow, when the skins were inspected, that they were thin-furred and worthless. A few survivors, however, remain to this day.

Along and off the coast of Chile and Bolivia are the St. Felix, Juan Fernandez, and Masafuera islands, the latter place being one of the most celebrated rookeries known to southern sealers. The west coast of Patagonia and a portion of that of Terra del Fuego was in those early days of seal hunting, and is to-day, the finest connected range of seal-rookery ground in the south. Here was annually made the concentrated attack of that sealing fleet above referred to; and one can readily understand how thorough must have been its labor, as he studies the great extent and deep indentation of this coast, its thousand and one islands and islets, and when he knows to-day that there is scarcely a bunch of fur seals known to exist there. The Falkland Islands, just abreast of the Straits of Magellan, were also celebrated and a favorite resort, not only of the sealers, but for the whale fleets of the world. They are recorded, in the brief mention made by the best authority, as fairly swarming with fur seals when they were opened up by Captain Cook. There are to-day, in the place of the hundreds of thousands that once existed, an insignificant number, taken notice of only now and then.

The Georgia Islands and the Sandwich group, all a succession of rocky islands and reefs awash—the South Orkneys, the Shetlands, the Auckland group, Campbell Island, Emerald Island, and a few islets lying just to the southward of New Zealand—have all been places of lively and continued butchery, the fur seals ranging in desperation from one of those places to the other as the seasons progressed and the merciless search and slaughter continued. These pinnipeds, however, never went to the southward of 62 degrees south latitude.

In considering these regions of the Antarctic I must not forget also to mention that the fur seal was in early times up the east coast of South America, here and there, in little rookeries, as far north as Cape St. Roque; but the number was unimportant when brought into contrast with that belonging to those localities which we have designated. A small cliff-bound rookery to-day exists at Cape Corrientes. This is owned and farmed out by Argentina, and we are informed that in spite of all their care and attention they have neither increased nor have they diminished from their original insignificance. From these rookeries only 5,000 to 10,000 were and are annually taken. Another small preserve on the Lobos islets, near the mouth of the River Plate, is also protected and leased by the Government of Uruguay, and from 12,000 to 15,000 skins are annually taken there.

When we look at our northern Atlantic waters, we speedily recognize the fact that between North America and Europe, across the Atlantic and into the Arctic, there is not a single island, or islet, or stretch of coast on which the fur seal could successfully struggle for existence; therefore it has never been found there. It appears as if our fur seals had originally passed to Bering Sea from the parent stock of the Patagonia region, up along the coast of South America, a few tarrying at the dry and heated Galapagos Islands, the rest speeding on to the northward, disturbed by the clear skies and sandy beaches of the Mexican Coast, on and up to the great fish-spawning shores of the Aleutian Islands and Bering Sea. There, on the Pribilov group and the bluffy Commander Islands, they found that union of cool water, well-adapted

landing, and moist, foggy air which they had missed since they left the storm-beaten coasts far below.

In the Antarctic waters of the Eastern Hemisphere seals were found at Tristan da Acunha, principally on Little Nightingale Island; the Crozets group, all small rocks, as it were, over which violent storms fairly swept; then we observe the great rookeries of Prince Edward's Group and Desolation Island—where perhaps nine-tenths of all the oriental fur seals congregated—thence over to a small and insignificant islet known as the Royal Company, south of Good Hope. This list includes all the known resting places of the fur seal in those waters.

In the North Pacific, during prehistoric times, a legend from Spanish authority states that fur seals were numerous or abundant on the Santa Barbara and Guadaloupe islands, off the coast of California and the peninsula to the southward. A few were annually taken from these islands up to 1835, and irregularly found there until 1874, an interregnum of some ten years: and, a few hundred skins were taken from there in 1885. None have been secured since. Also, fur seals were wont to sport and rest on those celebrated rocks off the harbor of San Francisco known as the Farralones; but, no tradition locates a seal rookery anywhere else on the northwest coast, or anywhere else in all Alaska and its islands, save the Pribilov group: while across and down the Asiatic coast, only the Commander Islands and a little rocky islet known as Robbens Reef (right under the lee of Sakhalen Island, Okotsk Sea) are known as the resort of this animal. The crafty savages of that entire region, the hairy Aino, and the Japanese themselves have searched in vain during the last hundred years for other ground frequented by these fur seals.

In the light of the foregoing remarks is it not natural, when we reflect upon the immense area and the exceedingly favored conditions of climate and ground frequented by the fur seals of the Southern Ocean, to say that their number must have been infinitely greater as they were first apprehended, surpassing all adequate description, when compared to those which we did regard as the marvel and wonder of our age—the breeding rookeries of the Pribilov group?

It is a great pity that this work of extermination in the Antarctic and senseless destruction should have progressed, as it has, to the very verge of total extinction, ere anyone was qualified to take note of and record the wonderful life thus eliminated. The Falkland Islands and the Shetlands at least might have been placed under the same restrictions and wholesome direction which the Russians established in the north seas, the benefits of which accrue to us until now, and will forever, if the evils now rampant are at once remedied. Certainly it is surprising that the business thought, the hardheaded sense, of those early English navigators should not have been equal to that of the Russian Promyshleniks, who were renowned as the most unscrupulous and the greediest of gain getters.

The Antarctic islands offered natural advantages of protection by land far superior to those found on the Pribilov or Commander groups. They had harbors and they laid outside of the track of commerce: advantages which are not all shared by our islands. At Desolation Island perhaps the difficulties were insuperable on account of the great extent of coast, which is practically inaccessible to man and nearly so to the seals; but the South Shetlands might have been farmed out by the British Government at a trifling outlay and with exceedingly good results, for millions upon millions of the fur seals could rest there to-day, as they did a hundred years ago, and be there to-morrow, as our seals do and are in Bering Sea. But the work is done. There is nothing

Area and Position of the Breeding Seals, Seasons of 1896.

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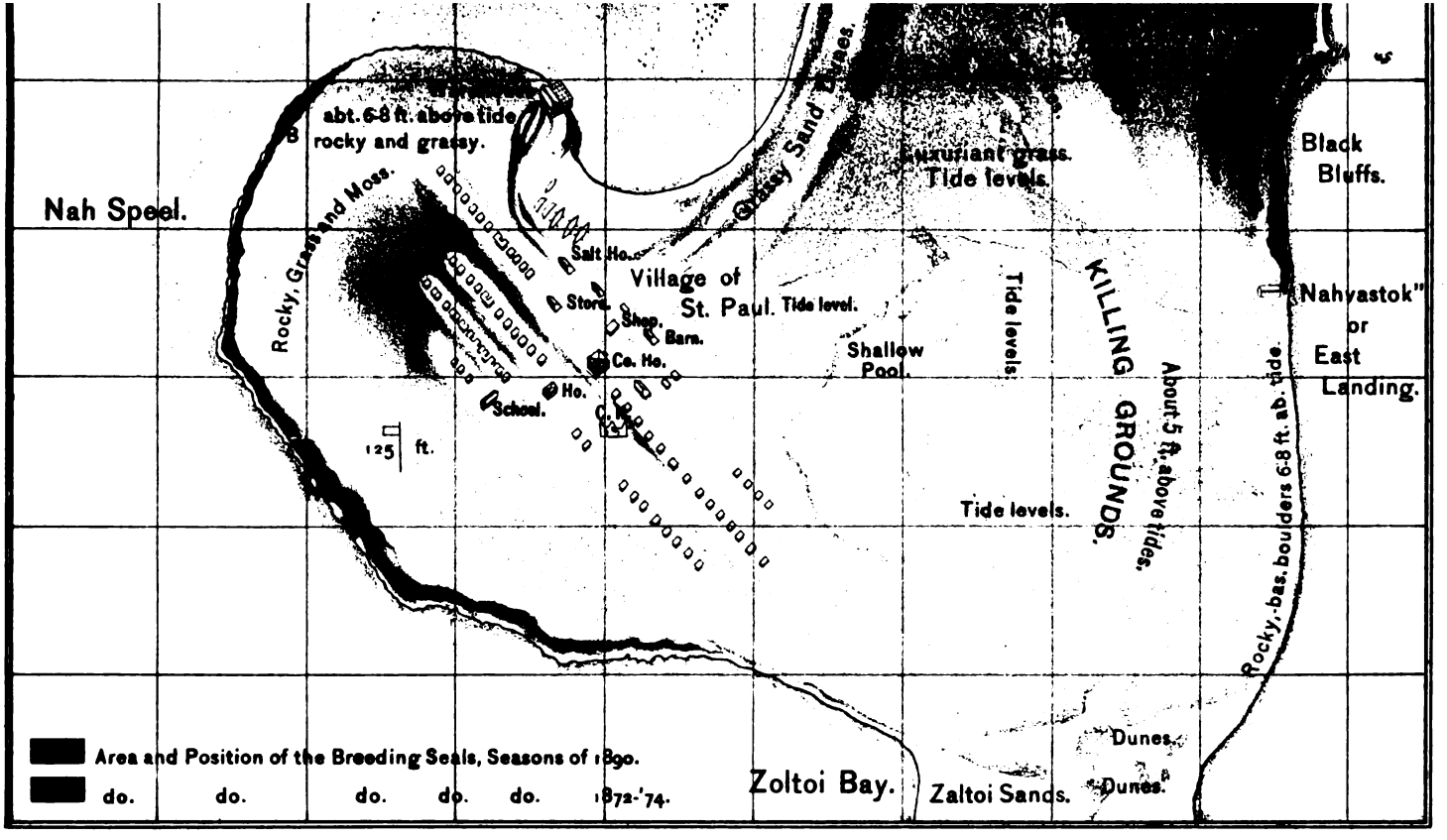
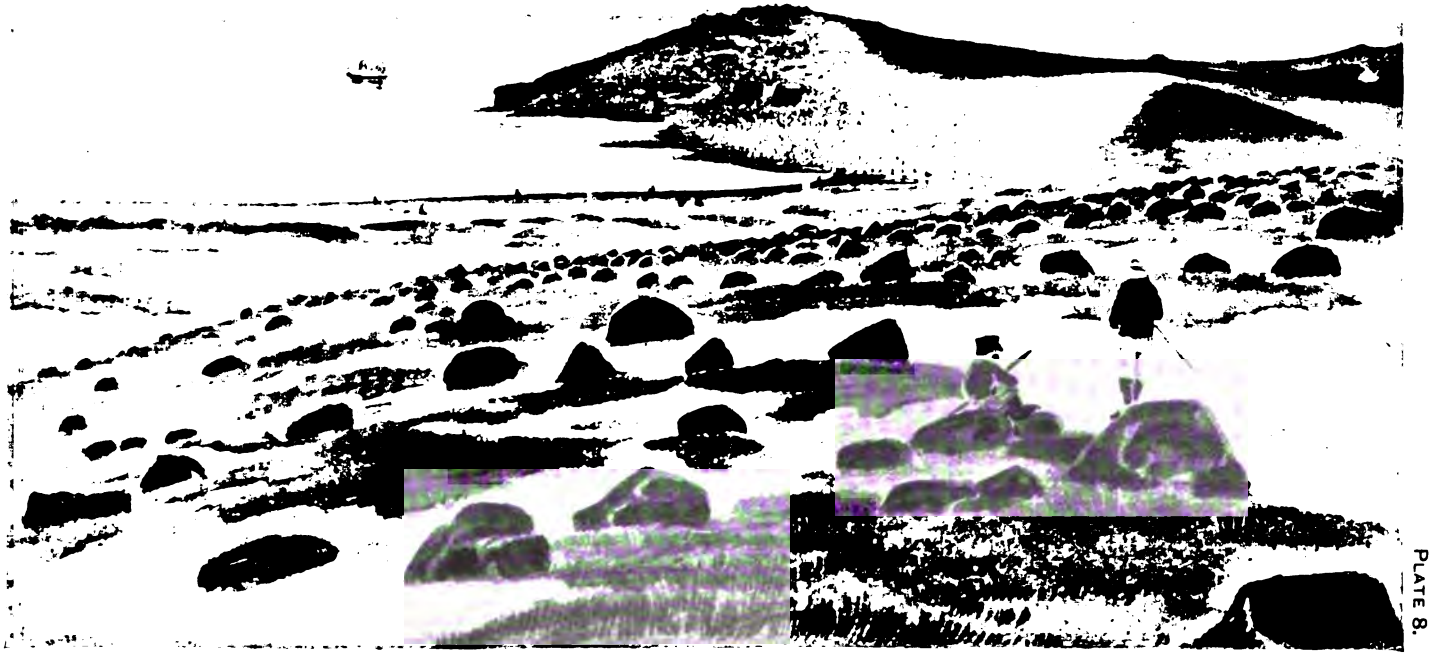

Nah Speel.
abt. 6-8 ft. above tide
rocky and grassy.
Rocky, Grass and Moss.
Grassy Sand Dunes.
Luxuriant grass.
Tide levels.
Black
Bluffs.
Salt Ho.
Village of
St. Paul. Tide level.
Store.
Shop.
Barn.
Co. Ho.
Ho.
School.
Shallow
Pool.
Tide levels.
KILLING GROUNDS.
About 5 ft. above tides.
Rocky, bas. boulders 6-8 ft. ab. tide.
"Nahvastok"
or
East
Landing.
125 ft.
Tide levels.
Dunes.
Dunes.
Zoltoi Bay.
Zaltoi Sands.
Area and Position of the Breeding Seals, Seasons of 1890.
do. do. do. do. do. 1872-'74.



A drawing from nature by the author.

LUKANNON ROOKERY, SAINT PAUL ISLAND.

Viewed from the abandoned hauling grounds on Volcanic Ridge, June 29, 1890.

PLATE 8.

position with the village, causes me to extend the lines of my survey of it, so as to include the entire site of the town, the killing grounds, the salt houses, and contiguous territory. It illustrates a remarkable paradox.

The natives say that when the village was first established here, it was placed under the southern slope of the Black Bluffs, near East Landing, in 1817; but the need of utilizing a good landing in the village cove finally became so urgent that, in spite of the present village site being then a large hauling ground for seals, with Nah Speel rookery in the foreground, the town was moved over and the seals driven off in 1824. This caused quite an exodus of breeding seals from Nah Speel, which established themselves then for the first time on the lagoon sea wall, across the cove. Prior to this date no fur seals had ever hauled there to breed.

The little rookery of Nah Speel has been gradually dwindling away since 1884; in 1886 only a few harems remained: and they disappeared altogether in 1887.

A detailed analysis of the survey of Lagoon rookery, as it is presented on the accompanying map, is unnecessary, since the eye at once grasps a simple extension of 1,500 feet of ragged sea margin and an irregular scattered massing, which is best expressed by allowing 12 feet of solid massing for the average depth. That gives ground for 9,000 seals—bulls, cows, and pups—July 12, 1890. The survey of 1872 gave a total here of 37,000 bulls, cows, and pups.

LUKANNON AND KEETAVIE ROOKERIES (1872-1874).

[*Their condition and appearance July, 1874.*]

The next rookeries in order can be found at Lukannon and Keetavie. Here is a joint blending of two large breeding grounds, their continuity broken by a short reach of sea wall right under and at the eastern foot of Lukannon Hill. The appearance of these rookeries is like all the others, peculiar to themselves. There is a rounded swelling hill at the foot of Lukannon Bay, which rises perhaps 160 or 170 feet from the sea, abruptly at the point, but swelling out gently up from the sand dunes in Lukannon Bay to its summit at the northwest and south. The great rookery rests upon the northern slope. Here is a beautiful adaptation of the finest drainage, with a profusion of those rocky nodules scattered everywhere over it, upon which the female seals so delight in resting.

Standing on the bald summit of Lukannon Hill, we can turn to the south and look over Keetavie Point, where another large aggregate of breeding seals comes under our eye. The hill falls away into a series of faintly terraced tables, which drop down to a flat that again abruptly descends to the sea at Keetavie Point. Between us and the Keetavie rookery, is the parade ground of Lukannon, a sight almost as grand as is that on the Reef, which we have feebly attempted to portray. The sand dunes to the west and to the north are covered with the most luxuriant grass, abruptly emarginated by the sharp abrasion of the hauling seals. This is shown very clearly on the general map. Keetavie Point is a solid basaltic shelf. Lukannon Hill, the summit of it, is composed of volcanic tufa and cement, with irregular cubes and fragments of pure basalt scattered all over its flipper-worn slopes. Lukannon proper has 2,270 feet of sea margin, with an average depth of 150 feet, making ground for 170,000 breeding seals and their young. Keetavie rookery has 2,200 feet of sea margin, with an average depth of 150 feet, making ground for 165,000 breeding seals and their young, a

whole aggregate of 335,000 breeding seals and their young. This is the point, where, down along the flat shoals of Lukannon Bay, the sand dunes are most characteristic, as they rise in their wind-whirled forms just above the surf wash. This also is where the natives come from the village during the early mornings of the season for driving, to get any number of holluschickie.

It is a beautiful sight, glancing from the summit of this great rookery hill up to the north, over that low reach of the coast to Tonkie Mees, where the waves seem to roll in with crests that rise in unbroken ridges for a mile in length each ere they break so grandly and uniformly on the beach. In these rollers the holluschickie are playing like sea birds, seeming to sport the most joyously at the very moment when the heavy billow breaks and falls upon them.

LUKANNON AND KEETAVIE ROOKERIES (1890).

[*Their condition and appearance July, 1890.*]

The unusually heavy loss sustained by Keetavie rookery, and the utter absence of the holluschickie, or killable young male seals, where they trooped in platoons of tens of thousands in 1872–1874 upon the Lukannon parade ground, made the view from Lukannon Hill an exceedingly sad one at any time last summer. Grass is growing thickly down to the very water's edge over the parade grounds of 1872–1874, and creeping into the rookery grounds also. This grass which springs up over an abandoned seal parade is quite different in fiber and color from that which has never been disturbed and destroyed by the seals. It is quickly noted and marked as "seal grass," since it grows closer and thicker and softer than all surrounding grasses.[1] There is no contradiction possible of its silent though eloquent testimony of the hour: of the absence of those swarming herds which so impressed me in 1872–1874, as they restlessly swept hither and thither over these grassy grounds and deserted fields of 1890.

A careful survey of the area and position of the breeding seals on Lukannon and Keetavie rookeries July 10, 1890, gives the following figures:

Detailed analysis of the survey of Lukannon rookery July 10, 1890.

[Sea margin of Lukannon rookery beginning at G and ending at D.]

	Square feet.
1,550 feet sea margin between G and F, with 70 feet average depth, massed	108,050
350 feet sea margin between F and E, with 80 feet average depth, massed	27,000
1,100 feet sea margin from E to D, too scattered and thin for an average depth	10,000
Total square feet	145,050

making ground for 72,525 seals—bulls, cows, and pups—against a total here in 1872–1874 of 171,000, a loss since then of 65 per cent.

Detailed analysis of the survey of Keetavie rookery July 10, 1890.

[Sea margin beginning at A and ending at D.]

	Square feet.
700 feet sea margin between A and B, with 30 feet average depth, massed	21,000
1,000 feet sea margin between C and D, with 35 feet average depth, massed	35,000
Total square feet	56,000

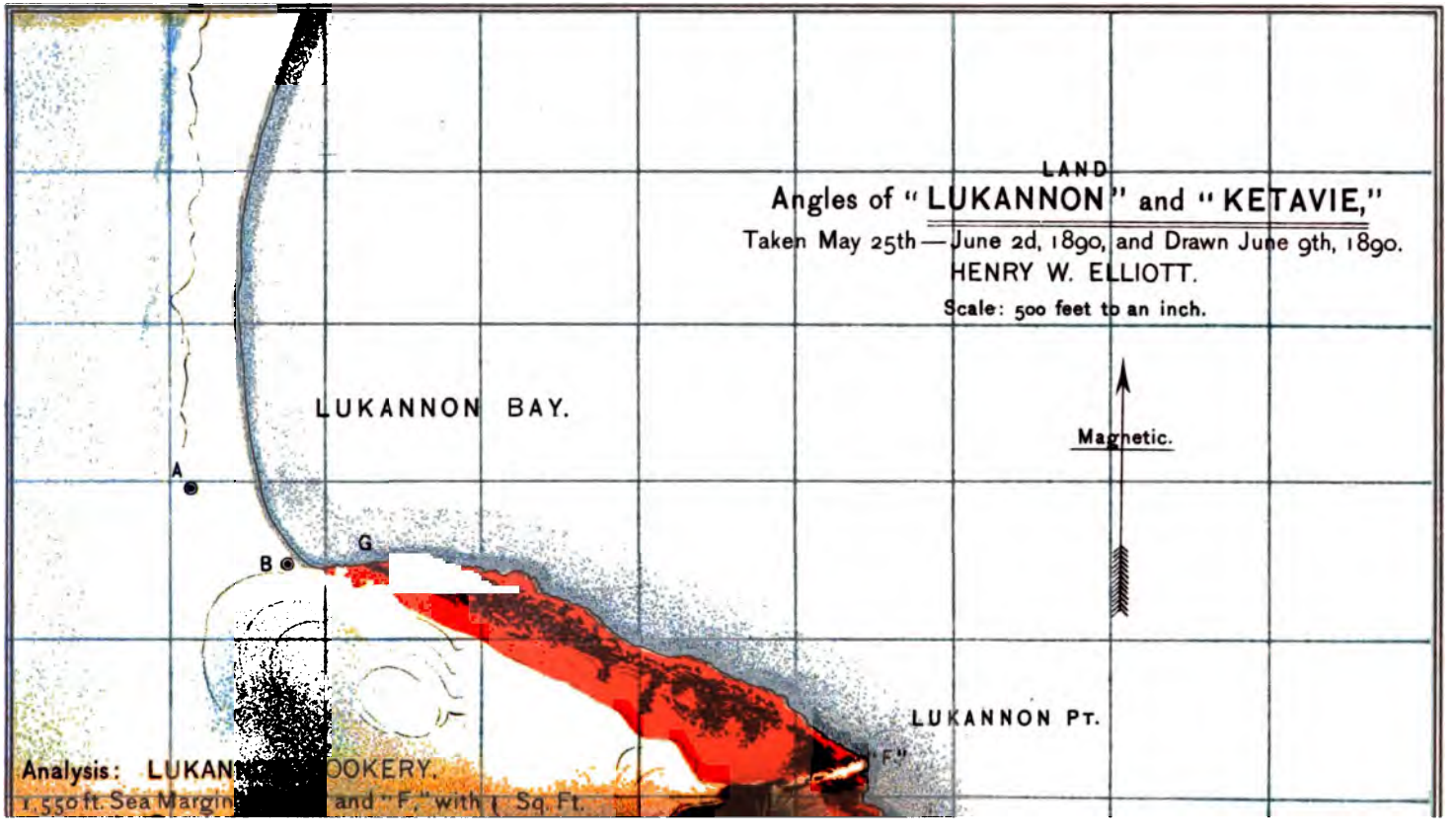
[1] *Glyceria angustata:* It is as conspicuous as a band of yellow emarginating that green ground of the indigenous growth of grasses and flora, where the seals have never been for a long, long time.

PLATE 9.

A drawing from nature by the author.

KETAVIE ROOKERY FROM KETAVIE ROCK, SAINT PAUL ISLAND, JULY 17, 1872.

View looking down over the rookery point to the east landing and the steamer's anchorage off the Black Bluffs. Neck of the Reef peninsula in the distance. [illegible] has suffered the greatest individual loss of life, since 1896, of all the rookeries on the Pribilov Islands. July [illegible]


LAND
Angles of "LUKANNON" and "KETAVIE,"
Taken May 25th — June 2d, 1890, and Drawn June 9th, 1890.
HENRY W. ELLIOTT.
Scale: 500 feet to an inch.
Magnetic.
LUKANNON BAY.
A
B
G
LUKANNON PT.
F
Analysis: LUKAN OOKERY.
1,550 ft. Sea Margin and "F," with 1 Sq. Ft.

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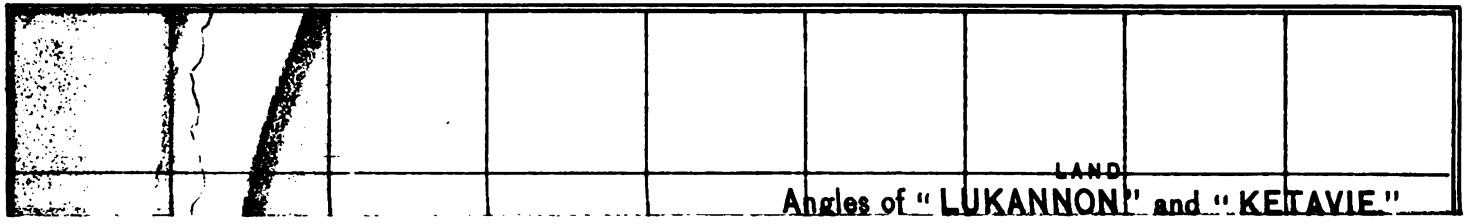
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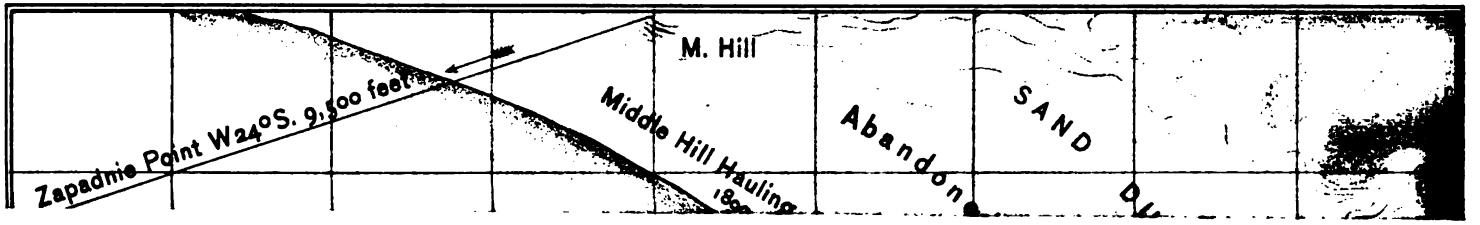
Angles of " LUKANNON " and " KETAVIE "

Angles of "LUKANNON" and "KETAVIE"


M. Hill
Zapadnie Point W24°S. 9,500 feet
Middle Hill Hauling
Abandon
SAND

making ground for 28,000 seals—bulls, cows, and pups—against a total of 165,000 in 1872-1874, a loss of 137,000 seals, or 85 per cent, since then.

This rookery is one of the worst wrecks in the general diminution—it is the worst, having suffered a greater loss than any other on St. Paul, or St. George, for that matter.

On Lukannon this last summer, while there were two-fifths as many cows as in 1872, yet the bulls did not average more than one-fifteenth of the number they showed in 1872. On Keetavie it was no better; if anything a shade worse, no young bulls anywhere offering service or attempting to land. This undue proportion of the sexes and the general apathy and advanced age of the breeding bulls, is characteristic of all the rookeries to-day, as we view them on the Pribilov Islands. Here and there, at wide intervals, we observe an alert, virile bull, while its companions all around are stretched out in somnolence or regarding the incoming cows with positive indifference. In 1872 it was just the opposite. I made then the following note:

Between the 12th and 14th of June the first of the cow seals, as a rule, come up from the sea; then the long agony of the waiting bulls is over, and they signalize it by a period of universal, spasmodic, desperate fighting among themselves. Though they have quarreled all the time from the moment they first landed and continue to do so until the end of the season—in August—yet that fighting which takes place at this date is the bloodiest and most vindictive known to the seal. I presume that the heaviest percentage of mutilation and death among the old males from these brawls occur in this week of the earliest appearance of the females.

A strong contrast now between the males and females looms up, both in size and shape, that is heightened by the air of exceeding peace and dove-like amiability which the latter class exhibit, in contradistinction to the ferocity and saturnine behavior of the former.

TOLSTOI ROOKERY, 1872-1874.

[*Its condition and appearance July, 1874.*]

Directly to the west from Lukannon, up along and around the head of the Lagoon, is that seal-path road over which the natives bring the holluschickie from Tolstoi. We follow this and take up our position on several lofty grass-grown dunes, close to and overlooking another rookery of great size; this is Tolstoi.

We have here the largest hill slope of breeding seals on either island peculiarly massed on the abruptly sloping flanks of Tolstoi Ridge, as it falls to the sands of English Bay and ends suddenly in the precipitous termination of its own name, Tolstoi Point. Here the seals are in some places crowded up to the enormous depth of 500 measured feet, from the sea margin of the rookery to its outer boundary and limitation; and, when viewed as I viewed it in July, taking the angles and lines shown on the accompanying sketch map, I considered it, with the bluff terminating it at the south and its bold sweep, which ends on the sands of English Bay, to be the most picturesque, though it is not the most impressive, rookery on the island; especially so when that parade ground, lying just back and over the point and upon its table rock surface, is reached by the climbing seals under your eyes.

If the observer will glance at the map, he will see that the parade ground in question lies directly back, over, and about 150 feet above the breeding seals immediately under it. The sand-dune tracts, which border the great body of the rookery, seem to check the holluschickie from hauling to the rear: for sand drifts here, in a locality so high and exposed to the full force of the wind, with more rapidity and consequently more disagreeable energy to the seals than anywhere else on the island.

A comical feature of this rookery is the appearance of blue foxes in those chinks under the parade ground and interstices of the cliffs. Their melancholy barking and short yelps of astonishment as we walk about, contrast quite sensibly with the utter indifference of the seals to our presence.

From Tolstoi, at this point, sweeping around 3 miles to Zapadnie, is the broad sand reach of English Bay, upon which, and back over its gently rising flats, are the great hauling grounds of the holluschickie, which I have indicated on the general map, and to which I made reference in a previous section of this chapter. Looking at the myriads of bachelor seals spread out in their restless hundreds and hundreds of thousands upon this ground, one feels the utter impotency of verbal description and reluctantly shuts his note and sketch books to gaze upon it with renewed fascination and perfect helplessness.

Tolstoi rookery has attained, I think, its utmost limit of expansion. The seals have already pushed themselves as far out upon the sand at the north as they can or are willing to go, while the abrupt cliffs, hanging over more than one-half of the sea margin, shut out all access to the rear for the breeding seals. The natives said that this rookery had increased very much during the last four or five years prior to the date of my making the accompanying survey. If it continues to increase, the fact can be instantly noted by checking off the ground and comparing it with the sketch map herewith presented. Tolstoi rookery has 3,000 feet of sea margin, with an average depth of 150 feet, making ground for 225,000 breeding seals and their young.

TOLSTOI ROOKERY, 1890.

[*Its condition and appearance July, 1890.*]

My picture of this rookery as above drawn in 1872, forms a remarkable contrast when held up in view of the picture which Tolstoi made in the height of the sealing season last summer. The scant, scattered massing of the breeding animals as exhibited this year over those same areas of splendid congregation in 1872, where 500 feet deep from the sea margin the breeding seals and their young laid in compact solid organization throughout the rutting season—this contrast between the condition of 1872 and 1890 was most vividly made here, since it is the only one of the St Paul rookeries which can be seen in all of its extent from a single point of view. It also was an exceedingly attractive rookery to visit in 1872, because from its height the vast sweep of those English Bay hauling grounds laid under your eyes, and the tens of thousands of holluschickie which then hauled out there, in sport or in sleep, were always to be seen whenever you glanced that way.

Not even a faint suggestion of 1872 appeared on this hauling ground of English Bay last summer: and the shriveled form of Tolstoi rookery in 1890 is best expressed by the figures which follow explanatory of the accompanying map:

Detailed analysis of the survey of Tolstoi rookery July 10, 1890.

[Sea margin beginning at A and ending at D.]

	Square feet.
800 feet sea margin between A and B, with 80 feet average depth, massed	64,000
400 feet sea margin between B and C, with 60 feet average depth, massed	24,000
1,600 feet sea margin between C and D, with 10 feet average depth, massed	16,000
Jag E has 300 feet of depth, with 40 feet average width, massed	12,000
Jag F has 100 feet of depth, with 40 feet average width, massed	4,000
Jag G has 120 feet of depth, with 40 feet of average width, massed	4,800
Total square feet	124,800

PLATE 10.

A drawing from nature by the author.

TOLSTOI ROOKERY FROM THE SANDS UNDER MIDDLE HILL, SAINT PAUL ISLAND, JULY 11, 1890.

making ground for 62,400 seals—bulls, cows, and pups—against a total of 225,000 in 1872–1874. These figures declare a decrease here of 162,600 seals since my earlier survey, or a loss of some 75 per cent.

While there appears to be a little more than one-fourth only of the females here as compared with their number of 1872, yet the proportion of loss in males is still more startling—there is not one-fifteenth of the showing made by the bulls in 1872–1874, and not a single young bull seen upon the ground offering service—not one even attempting to land at the water's edge. The half dozen that I did see on the outskirts of the rookery were evidently dropped from sealing drives, broken spirited and utterly worthless.

The topographical features of this ground are wholly unchanged since my survey of 1872. The sands still drift with their accustomed disagreeable energy backward and forward between Middle Hill and the base of the rookery; but being bare of seal life last summer, they seem to aid in the expression of a deeper air of desolation than that given to any other one spot on the islands save Keetavie.

ZAPADNIE ROOKERY (1872–1874).

[*Its condition and appearance July, 1874.*]

From Tolstoi, before going north, we turn our attention directly to Zapadnie on the west, a little over 2 miles as the crow flies across English Bay, which lies between them. Here again we find another magnificent rookery, with features peculiar to itself, consisting of great wings separating, one from the other, by a short stretch of 500 or 600 feet of the shunned sand reach which makes a landing and a beach just between them. The northern Zapadnie lies mostly on the gently sloping, but exceedingly rocky, flats of a rough volcanic ridge which drops there to the sea; it, too, has an approximation to the Tolstoi depth, but not to such a solid extent. It is the one rookery which I have reason to believe has sensibly increased since my first survey in 1872. It has overflowed from the boundary which I laid down at that time, and has filled up for nearly half a mile, a long ribbon-like strip of breeding ground to the northeast from the hill slope, ending at a point where a few detached rocks jut out, and the sand takes exclusive possession of the rest of the coast. These rocks aforesaid are called by the natives "Nearhpahskie Kammin," because it is a favorite resort for the hair seals. Although this extension of a very decided margin of breeding ground, over half a mile in length, between 1872 and 1876, does not in the aggregate, point to a very large increased number, still it is a gratifying evidence that the rookeries, instead of tending to diminish in the slightest, are more than holding their own.

Zapadnie in itself is something like the Reef plateau on its eastern face, for it slopes up gradually and gently to the parade plateau on top—a parade ground not so smooth, however, being very rough and rocky, but which the seals enjoy. Just around the point, a low reach of rocky bar and beach connects it with the ridge walls of Southwest Point. A very small breeding rookery, so small that it is not worthy of a survey, is located here. I think probably, on account of the nature of the ground, that it will never hold its own, and is more than likely abandoned by this time.

One of the prehistoric villages, the village of Pribilov's time, was established here between the point and the cemetery ridge, on which the northern wing of Zapadnie rests. The old burying ground, with its

ic Russian crosses and faded pictures of the saints, is plain
he ridge. It was at this little bight of sandy landing th
en first came ashore and took possession of the island, wh
in the same season proceeded to Northeast Point, and to th
to establish settlements of their own order. When th
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to pick the berries of the *Empetrum* and *Rubus*, whi
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en visited by the natives for the purpose of selectin
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en procured from Zoltoi, Lukannon, and Lower Tolst
re all very close to the village. I have been told, sinc
vey, that during the past year the breeding seals o
verflowed, so as to occupy all of the sand strip which
n them on the accompanying map.

ZAPADNIE ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

e to convey that full sense of utter desolation which
rea of 1872 on this fine rookery aroused in my mind
then making my survey of it. Grass and flowers
those broad areas back of the breeding grounds here,
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er, throughout the entire season, and were undisturbed
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lnies and Tolstoi, *is all grass grown to-day* except
ifting sand, with mosses, lichens, and flowers inter
rely bare of seals save a lonely pod under Middle

s certainly the roughest surfaced breeding ground
islands: and it is a curious place on which to view
cate themselves, for as you walk along they sud-
appear as they lay in those queer little valleys and
have been formed by lava bubbles of the geolog-
tion of St. Paul Island from the sea. But to-day,
ng of the breeding seals here, that that unbroken
d out from them in 1872 is wholly absent; it is

A drawing from nature by the author.

ZAPADNIE ROOKERY, SAINT PAUL ISLAND, JULY 18, 1890.

Viewed from the crest of Cemetery Ridge, above Upper Zapadnie; the killing gang coming over from the village with the bidarrah.

characteristic Russian crosses and faded pictures of the saints, is plainly marked on the ridge. It was at this little bight of sandy landing that Pribilov's men first came ashore and took possession of the island, while some others, in the same season proceeded to Northeast Point, and to the north shore to establish settlements of their own order. When the indiscriminate sealing of 1868 was in progress, one of the parties lived here, and a salt house, which was then erected by them, still stands. It is in a very fair state of preservation, although it has never been since occupied, except by the natives who come over here from the village in the summer to pick the berries of the *Empetrum* and *Rubus*, which abound in the greatest profusion around the rough and rocky flats that environ the little lake adjacent. The young people of St. Paul are very fond of this berry festival, so called among themselves, and they stay here every August, camping out a week or ten days at a time, before returning to their homes in the village.

Zapadnie rookery has, the two wings included, 5,880 feet of sea margin, with an average depth of 150 feet, making ground for 441,000 breeding seals and their young, being the second rookery on the island as to size and importance.

The holluschickie that sport here on the parade plateau, and indeed over all of the western extent of the English Bay hauling grounds, have never been visited by the natives for the purpose of selecting killing drives since 1872, inasmuch as more seals than were wanted have always been procured from Zoltoi, Lukannon, and Lower Tolstoi points, which are all very close to the village. I have been told, since making this survey, that during the past year the breeding seals of Zapadnie have overflowed, so as to occupy all of the sand strip which is vacant between them on the accompanying map.

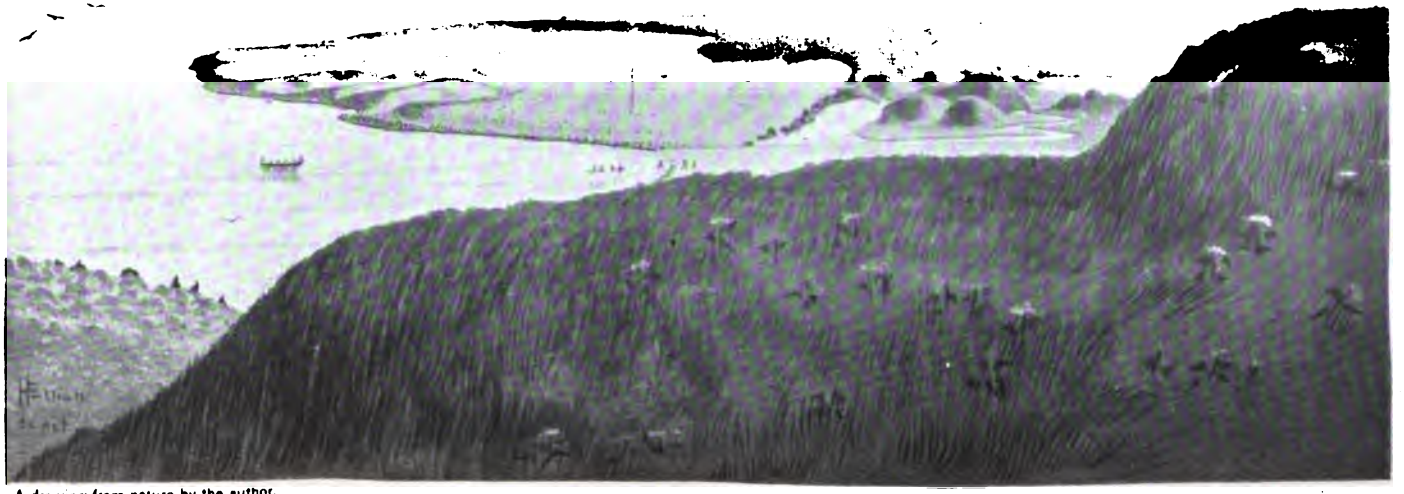
ZAPADNIE ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

It is impossible to convey that full sense of utter desolation which the vacant seal area of 1872 on this fine rookery aroused in my mind last July, while then making my survey of it. Grass and flowers springing up over those broad areas back of the breeding grounds here, where in 1872–1874, thousands upon thousands of young male seals hauled out and over, throughout the entire season, and were undisturbed by any man, not even visited by any one except myself! No one then even thought of such a thing as coming over from the village to make a killing at Zapadnie, there being more seals than wanted then close by at Tolstoi, Lukannon, and Zoltoi sands. This not alone, but that splendid, once clean-swept expanse of hauling ground in English Bay between the Zapadnies and Tolstoi, *is all grass grown to-day* except over its areas of drifting sand, with mosses, lichens, and flowers interspersed! It is entirely bare of seals save a lonely pod under Middle Hill.

Lower Zapadnie is certainly the roughest surfaced breeding ground peculiar to the seal islands: and it is a curious place on which to view the seals as they locate themselves, for as you walk along they suddenly appear and disappear as they lay in those queer little valleys and canyons here, which have been formed by lava bubbles of the geological time of the elevation of St. Paul Island from the sea. But to-day, so scant is the massing of the breeding seals here, that that unbroken uproar which boomed out from them in 1872 is wholly absent; it is

PLATE 11.



A drawing from nature by the author.

ZAPADNIE ROOKERY, SAINT PAUL ISLAND, JULY 18, 1890.

quiet, save the subdued sheep-like[1] calling of the females ıb-like answer of their offspring.

ıreeding ground of Zapadnie was the second one in size and on St. Paul in 1872, the figures which my survey of last nt, show an extraordinary decrease here and make a melan- ıit.

led analysis of the survey of Lower Zapadnie rookery July 11, 1890.

[Sea margin beginning at Q and ending at Zapadnie Point.]

	Square feet.
ı margin between Q and Zapadnie Point, with 20 feet average sed	54,000
'eet deep above sea margin, with 50 feet average width, massed	20,000
feet deep above sea margin, with 60 feet average width, massed	18,000
feet deep above sea margin, with 35 feet average width, massed	13,300
feet deep above sea margin, with 75 feet average width, massed	15,000
feet deep above sea margin, with 75 feet average width, massed	13,125
feet deep above sea margin, with 60 feet average width, massed	21,000
feet deep above sea margin, with 60 feet average width, massed	12,000
feet deep above sea margin, with 40 feet average width, massed	5,000
quare feet	171,425

ɔund for 85,705 seals—bulls, cows, and pups—against a total n 1872.

:es for Upper Zapadnie are not much better. I regard it as parcel of but one rookery, i. e., Zapadnie: but, for clearness ın in survey, separate the wings.

led analysis of the survey of Upper Zapadnie rookery July 11, 1890.

ea margin beginning at Q, ending at V, resumed at W, and ending at R.]

	Square feet.
margin between Q and V, with 40 feet average depth, massed	48,000
margin (beach) between W and R, with 10 feet average depth,	23,000
quare feet	71,000

ɔund for 35,000 seals—bulls, cows, and pups—against a total ı 1872, or a total to-day of 121,205 for Zapadnie entire against 1872.

POLAVINA ROOKERY (1872–1874).

[*Its condition and appearance July, 1874.*]

between the village and Northeast Point lies Polavina: e of the seven large breeding grounds on this island. The s cone-shaped head of Polavina Sopka rises clearly cut and ın the plateau at its base, which falls 2 miles to the eastward

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ɔ similar is the sound that I noticed that a number of sheep which the mercial Company had brought up from San Francisco to St. George ıg the summer of 1873, were constantly attracted to the rookeries, and g in among the holluschickie: so much so, that they neglected the good ı the uplands beyond, and a small boy had to be regularly employed to rhere they could feed to advantage. These transported *Ovidæ*, though ıot possibly find anything in their eyes suggestive of companionship eals, had their ears so charmed by the sheep-like accents of the female to persuade them against their senses of vision and smell.

which arose in 1872 from these great breeding grounds of the fur seal ınds upon tens of thousands of angry, vigilant bulls were roaring, chuck- ping, and multitudes of seal mothers were calling in hollow bleating r young, that in turn responded incessantly, is simply defiance to verbal It was, at a slight distance, softened into a deep booming, as of a cata-

and southeastward, sharp off into the sea, presenting a bluff margin over a mile in length, at the base of which the sea thunders incessantly. It exhibits a very beautiful geological section of the simple structure of St. Paul. The ringing, iron-like basaltic foundations of the island are here setting boldly up from the sea to a height of 40 or 50 feet, black and purplish red, polished like ebony by the friction of the surf and worn by its agency into grotesque arches, tiny caverns, and deep fissures. Surmounting this lava bed is a cap of ferruginous cement and tufa from 3 to 10 feet in thickness, making a reddish floor upon which the seals patter in their restless, never-ceasing evolutions, sleeping or waking, on the land. It is as great a single parade plateau of polished cement as is that of the Reef: but, we are unable from any point of observation, to appreciate it, inasmuch as we can not stand high enough to overlook it unless we ascend Polavina Sopka, and then the distances, with the perspective foreshortening, destroy the effect.

The rookery itself, occupies only a small portion of the seal-visited area at this spot. It is placed at the southern termination and gentle sloping of the long reach of bluff wall, which is the only cliff between Lukannon and Novastoshnah. It presents itself to the eye, however, in a very peculiar manner, and with great scenic effect when the observer scans it from the southern point of its mural elevation; viewed from thence, nearly a mile to the northeast, it rises as a front of bicolored lava wall, high above the sea that is breaking at its base, and is covered with an infinite detail of massed seals in reproduction. At first sight one wonders how they got there; no passages whatever can be seen, down or up. A further survey, however, discloses the common occurrence of rain-water runs between surf-beaten crevices, which make many stairways for the adhesive feet of *Callorhinus*, amply safe and comfortable.

For the reason cited in a similar example at Zapadnie, no holluschickie have been driven from this point since 1872, though it is one of the easiest worked. It was, in the Russian times, a pet sealing ground with them. The remains of the old village have nearly all been buried in the sand near the lake, and there is really no mark of its early habitation, unless it be the singular effect of a human graveyard being dug out and despoiled by the attrition of seal bodies and flippers. The old cemetery just above and to the right of the barrabkie, near the little lake, was originally established, so the natives told me, far away from the hauling of the holluschickie. It was, when I saw it in 1876, in a melancholy state of ruin. A thousand young seals at least moved off from its surface as I came up, and they had actually trampled out many sandy graves, rolling the bones and skulls of Aleutian ancestry in every direction. Beyond this old barrabkie, which the present natives have established as a house of refuge for the winter when they are

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ract; and I have heard it, with a light fair wind to the leeward, as far as 6 miles out from land on the sea; and even in the thunder of the surf and the roar of heavy gales it would rise up and over to your ear for quite a considerable distance away. It was the monitor which the sea captains anxiously strained their ears for when they ran their dead reckoning up and were laying to for the fog to rise in order that they might get their bearings of the land. Once heard they held on to the sound and felt their way in to anchor. The seal roar at Novastoshnah during the summer of 1872 saved the life of the surgeon and six natives belonging to the island, who had pushed out on an egging trip from Northeast Point to Walrus Island. I have sometimes thought, as I have listened through the night to this volume of extraordinary sound, which never ceases with the rising or the setting of the sun throughout the entire season of breeding, that it was fully equal to the churning boom of the waves of Niagara. Night and day, throughout the season of 1872, this din upon the rookeries was steady and constant.

PLATE 12.

A drawing from nature by the author.

POLAVINA BOPKA: 650 FEET

POLAVINA ROOKERY AND HAULING GROUND, SAINT PAUL ISLAND, JULY 18, 1872.

ng foxes, looking to the west over the lake, is a large expanse of at swale and tundra, which is terminated by the rocky ridge of iista. Every foot of it has been placed there subsequent to the al elevation of the island by the action of the sea, beyond all ques- It is covered with a thick growth of the rankest sphagnum, which s and trembles like a bog under one's feet, but over which the beautiful mosses ever and anon crop out, including the character- oral display before referred to in speaking of the island. Most way from the village up to Northeast Point, as will be seen by a y glance at the map, with the exception of this bluff of Polavina ie terraced table setting back from its face to Polavina Sopka, iole land is slightly elevated above the level of the sea, and its line is lying just above and beyond the reach of the surf where ledges of sand have been piled by the wind, capped with sheafs ifts of rank-growing *Elymus*.

re is a small rookery which I call Little Polavina, indicated here, oes not promise much for the future. The sand cuts it off on the and sand has blown around so at its rear as to make all other d not now occupied by the breeding seals there, quite ineligible. ina rookery has 4,000 feet sea margin, including Little Polavina, 50 feet average depth, making ground for 300,000 breeding seals ieir young.

POLAVINA ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

survey, July 13, 1890, of this breeding ground shows it to be one two rookeries only, which have suffered on St. Paul Island no er loss than from 50 to 55 per cent of their general form and num- recorded in 1872. Yet I can not avoid the conclusion, however, his rookery has been hard driven from during the last eight years, the chief hauling grounds lay directly up in the rear of the breed- nes. Therefore, when the shrinking of the supply of holluschickie i, the driving of the killable seals here involved a regular scraping large semicircular edge of Polavina rookery whenever a drive was . In illustration of this, a drive made here on the 18th of July, ght in, out of a total of 1,541 animals, 172 old breeding bulls! which een scraped up on the rookery margin by the native drivers, who *obliged to take these old fellows along, or lose the handful of killa- ung male seals that they were after.* I witnessed this driving, and iot only these old bulls, but cows swept up into the stampeded herd; pups left bruised and helpless behind to starve and to otherwise h.

is is a locality where, until 1872, like the Zapadnie and Southwest areas, the fur seals on St. Paul Island had been undisturbed by ealers since 1857; therefore, the holluschickie and the breeding had polished the whole surface of that high plateau laying gently from the bluffs, a mile of sea margin, way back entirely free from ation, 1,000 to 2,000 feet; every vestige of vegetable growth utterly nated by their flippers. The reddish to blood-red breccia and rs that compose the floor to this parade ground of Polavina was lly powdered by the attrition of seal flippers into an impalpable lust, which, during every windy day, would rise in columns and s to betray the locality to your eye from all points of the island, often has suggested to sailors at sea the idea of a steamer under within lee of the land. During misty, foggy, and wet days this

soil would and does now resolve itself into the condition of a rich moist humus: and, after heavy rains a thick paste, if puddled by the seals.

The natives in Russian times had a small village on the lake shore near by this rookery, and regularly worked this field especially severe, up to that season of utter diminution which ended in 1834 by the stopping of all killing for shipment on St. Paul and St. George. When that zapooska was ordered, the settlement at Polavina was abandoned: then its people removed to the present location, which was established in 1824; also, the Northeast Point village was brought down at this time to the existing town site, and that consolidation was final.

Since that time up to 1882, beyond a few small drives made early in June (driven for food), no seals in considerable number had been drawn from the hauling grounds of Polavina, from Zapadnie, or Southwest Point. But, as the regular source of abundant supply near the village became exhausted, then, in 1882, the draft upon these fine reserves of Polavina and Zapadnie became sudden and steady every killable seal was scraped up: easily at first, and ruggedly during the last two years: and I may add, with great severity during 1889, and also through the present season of 1890.

So, when I regard this ground to-day, after an interval of sixteen years since my last survey, I find a square declaration from the ground itself of loss to this rookery of one-half of its female life, while its breeding bulls are not equal to one-fifteenth of their number here in 1872. Then, too, the utter absence of a young bull on the vacant spaces in the rookery or in the water at its sea margin: and, still more remarkable in contrast, that pronounced utter absence of the holluschickie from their grand parade ground here—that silent, empty space before me on which at this time in 1872 anywhere from 75,000 to 100,000 young male seals were trooping in and out from the water, frolicking in tireless antics one with another or wrapped in profound sleep—this deserted parade ground of Polavina, like unto all the others on both islands, speaks most eloquently and truthfully of the present order and condition of these interests of our Government. My survey as exhibited on the accompanying chart gives the following figures:

Detailed analysis of the survey of Polavina rookery, July 13, 1890.

[Sea margin beginning at E and ending at D.]

	Square feet.
150 feet sea margin, from D to D^2, with 100 feet average depth, massed	15,000
900 feet sea margin, from D^2 to E^2, with 200 feet average depth, massed	180,000
150 feet sea margin, from E^2 to E, with 100 feet average depth, massed	15,000
Jags 1, 2, 3, and 4 have 400 feet of sea margin, with 100 feet of average width	40,000
Total square feet	250,000

making ground for 125,000 seals—bulls, cows, and pups—against a total of 240,000 in 1872.

Detailed analysis of the survey of Little Polavina rookery, July 13, 1890.

[Sea margin beginning at c and ending at d.]

	Square feet.
175 feet sea margin, from C to b, with 20 feet average depth, massed	3,500
280 feet sea margin, from b to a, with 100 feet average depth, massed	28,000
100 feet sea margin, from a to d, with 30 feet average depth, massed	3,000
Total square feet	34,500

making ground for 17,250 seals—bulls, cows, and pups—against a total of 60,000 in 1872. This survey gives a total for the Polavinas of 142,250 for 1890 against the total they possessed of 300,000 in 1872–1874.

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nd, after heavy rains a thick paste, if puddled by the se
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his rookery, and regularly worked this field especially
season of utter diminution which ended in 1834 by the
killing for shipment on St. Paul and St. George. Wh
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removed to the present location, which was establi
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owing figures:

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[Sea margin beginning at E and ending at D.]

in, from D to D², with 100 feet average depth, massed .....
in, from D² to E², with 200 feet average depth, massed .....
in, from E² to E, with 100 feet average depth, massed .....
have 400 feet of sea margin, with 100 feet of average width.

e feet.....

l for 125,000 seals—bulls, cows, and pups—against a
872.

alysis of the survey of Little Polavina rookery, July 13, 1890.

[Sea margin beginning at c and ending at d.]

, from C to b, with 20 feet average depth, massed.....
from b to a, with 100 feet average depth, massed.....
, from a to d, with 30 feet average depth, massed.....

feet.....

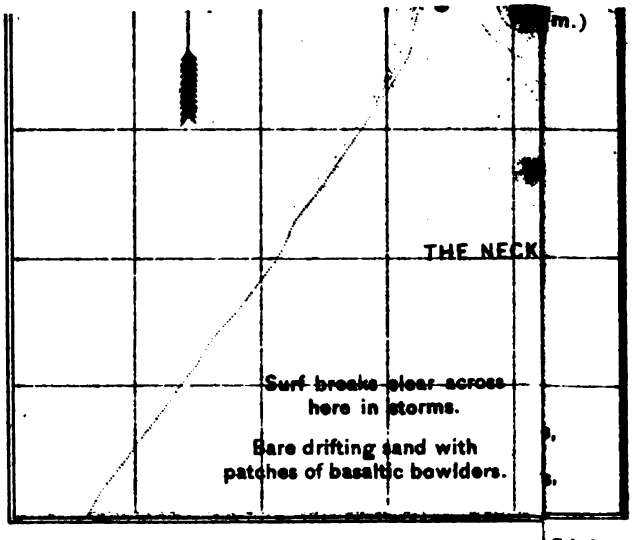
or 17,250 seals—bulls, cows, and pups—against a

This survey gives a total for the Polavinas of 142
he total they possessed of 300,000 in 1872–1874.

OLD BULLS SPRAWLED OUT ON POLAVINA, JUNE 3, 1890.

View showing the scant and scattered distribution of the bulls on the breeding grounds, season of 1890. Not one bull out here where ten were located at this landing ground from the single and abandoned landing grounds thereon.

A drawing from nature by the author.


m.)
THE NECK
Surf breaks clear across here in storms.
Bare drifting sand with patches of basaltic bowlders.

54 1.

NORTHEAST POINT OR NOVASTOSHNAH ROOKERY (1872–1874).

[*Its condition and appearance July, 1874.*]

Though this is the last of the St. Paul rookeries which I notice: yet it is so much greater than any other one on the island, or two others for that matter, that it forms the central feature of St. Paul, and in truth presents a most astonishing and extraordinary sight. It was a view of such multitides of amphibians, when I first stood upon the summit of Hutchinson Hill and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me full courage to maintain the truth in regard to this subject.

The result of my first survey here, presented such a startling array of superficial area massed over by the breeding seals that I was fairly disconcerted at the magnitude of the result. It troubled me so when my initial plottings were made, and I had worked them out so as to place them tangibly before me, that I laid the whole preliminary survey aside, and seizing upon the next favorable day went over the entire field again. The two plats then, laid side by side, substantially agreed, and I now present the great rookery to the public. It is in itself, as the others are, endowed with its own particular physiognomy, having an extensive sweep, everywhere surrounded by the sea, except at that intersection of the narrow neck of land which joins it to the island. Hutchinson Hill is the foundation of the point; a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner, which is so rough and yet polished so highly by the countless pattering flippers of its visitors, as to leave it entirely bare and bald of every spear of grass or trace of cryptogamic life. The hill is about 120 feet high; it has a rounded summit flecked entirely over by the holluschickie, while the great belt of breeding rookery sweeps high up on its seaward flanks, and around right and left for nearly 3½ miles unbroken—an amazing sight in its aggregate, and infinite in its detail.

A picturesque feature, also, of the rookery here is the appearance of those tawny, yellowish bodies of several thousand sea lions which lie in and among the fur seals at the several points designated on the sketch map, though never far from the water. Sea Lion Neck, a little tongue of low basaltic jutting, is the principal corner where the natives take these animals from, when they capture them in the fall for their hides and sinews.[1]

Cross or St. John Hill, which rises near the lake to a height of 60 or 70 feet, and is quite a landmark itself, is a perfect cone of sand entirely covered with a luxuriant growth of *Elymus*. It is growing constantly higher by the fresh deposit brought by wind, and is retained by the annually rising grasses.

At this point it will be noticed there is a salt house: and, here is the killing ground for Northeast Point, where 19,000 or 20,000 holluschickie are disposed of for their skins every season, their carcasses being spread out on the sand dunes between the foot of Cross Hill and Webster's house. A squad of sealers live there during the three or four

[1] The sea lions breed on no one of the other rookeries at this island, the insignificant number that I noticed on Seevitchie Kammin excepted. At Southwest Point, however, I found a small sea lion rookery, but there are no breeding fur seals there. A handful of *Eumetopias* used to breed on Otter Island, but do not now, since it has been necessary to station Government agents there for the apprehension of fur-seal pirates during the sealing season.

weeks that they are engaged in this work. The holluschickie are driven from the large hauling grounds on the sand flats immediately adjacent to the killing grounds, being obtained without the slightest difficulty.

Here also was the site of a village, once the largest one on this island ere its transfer to the sole control and charge of the old Russian-American Company, ten years after its discovery in 1787. The ancient cemetery and the turf lines of the decayed barraboras are still plainly visible.

The company's steamer runs up here, watching her opportunity, she drops her anchor, as indicated on the general chart, right south of the salt house in about 4 fathoms of water; then the skins are invariably hustled aboard, no time being lost, because it is an exceedingly uncertain place to safely load the vessel.

The "podding" of these young pups in the rear of the great rookeries of St. Paul is one of the most striking and interesting phases of this remarkable exhibition of highly organized life. When they first bunch together they are all black, for they have not begun to shed the natal coat; they shine with an unctuous, greasy reflection, and grouped in small armies or great regiments on the sand-dune tracts at Northeast Point, they present a very extraordinary and fascinating sight. Although the appearance of the holluschickie at English Bay fairly overwhelms the observer with the impression of its countless multitudes, yet I am free to declare that at no one point in this evolution of the seal life, during the reproductive season, have I been so deeply stricken by the sense of overwhelming enumeration as I have when, standing on the summit of Cross Hill, I looked down to the southward and westward over a reach of 6 miles of alternate grass and sand-dune stretches, mirrored upon which were hundreds of thousands of these little black pups, spread in sleep and sport within this restricted field of vision. They appeared as countless as the grains of sand upon which they rested!

There is no impression in my mind really more vivid than is the one which was planted there during the afternoon of that July day when I first made my survey of this ground. Indeed, whenever I pause to think of the subject, this great rookery of Novastoshnah rises promptly to my view and I am fairly rendered voiceless as I try to speak in definition of the spectacle. In the first place, this slope from Sea Lion Neck to the summit of Hutchinsons Hill is a long mile, smooth and gradual from the sea to the hilltop. The parade ground lying between, is also nearly three-quarters of a mile in width, sheer and unbroken. Now, upon that area before my eyes, this day and date of which I have spoken, were the forms of not less than three-fourths of a million seals. Pause a moment. Think of the number: three-fourths of a million seals moving in one solid mass from sleep to frolicsome gambols, backward, forward, over, around, changing and interchanging their heavy squadrons, until the whole mind is so confused and charmed by the vastness of mighty hosts that it refuses to analyze any further! Then, too, I remember that the day was one of exceeding beauty for that region. It was a swift alternation overhead of those characteristic rain fogs, between the succession of which the sun breaks out with transcendent brilliancy through the misty halos about it. This parade field reflected the light like a mirror, and the seals, when they broke apart here and there for a moment, just enough to show its surface, seemed as though they walked upon the water. What a scene to put upon canvas, that amphibian host involved in those alternate rainbow lights and blue-gray shadows of the fog!

PLATE 14.

A drawing from nature by the author.

SEAL PUPS PODDING ON ZOLTOI, SAINT PAUL ISLAND, AUGUST AND SEPTEMBER, 1872.

characteristic movements of the young fur seals when six to eight weeks old; they haul off from the breeding grounds in large bands or pods to sleep and

NOVASTOSHNAH (1890).

[*Its condition and appearance July, 1890.*]

As this great rookery was the object of my chief admiration in 1872, now it, in 1890, again becomes the main idea of my concern—not admiration to-day, but my chief pity, for this breeding ground has suffered a startling loss of life during the last eight years. It presents the deepest shadow, now, to that sunshine in which I saw it eighteen years ago, as I then walked around and over it. I surveyed the ground last summer as one would locate a graveyard: not more than a suggestion of the massed life of 1872 have I been able to see within its desolate area. That ground, which I have described in 1874, as covered with hosts of amphibians, is again before me to-day with not a single herd of seals upon it—*actually green with upspringing grass and colored and flecked with varied flowers!*

The accompaying map with the tinted massing of 1872–1874, contrasted with that of 1890, speaks for itself—the great rookery of Novastoshnah is a mere wreck to-day, and the chart rudely but forcibly declares it.

Detailed analysis of the survey of Novastoshnah rookery, July 13, 1890.

[Sea margin extending from A in the southeast to B in the southwest, 11,435 feet.]

	Square feet.
A to B, 700 feet sea margin, 35 feet deep, massed	24,500
Sea Lion Neck harems scattered among sea lions, an estimate only	6,000
C to D, 300 feet sea margin, 200 feet deep, massed	60,000
D to E, 400 feet sea margin, 10 feet deep, massed	4,000
F to G, 200 feet sea margin, 35 feet deep, massed	7,000
G to H, 550 feet sea margin, 12 feet deep, massed	6,600
H to I, 400 feet sea margin, 35 feet deep, massed	14,000
I to J, 500 feet sea margin, 10 feet deep, massed	5,000
J to K, 400 feet sea margin, 35 feet deep, massed	14,000
K to L, 200 feet sea margin, 10 feet deep, massed	2,000
L to M, 700 feet sea margin, 20 feet deep, massed	14,000
N to O, 2,100 feet sea margin, 60 feet deep, massed	126,000
P to Q, 420 feet sea margin, 30 feet deep, massed	12,600
R to S, 425 feet sea margin, 20 feet deep, massed	8,500
S to T, 350 feet sea margin, 10 feet deep, massed	3,500
T to U, 550 feet sea margin, 30 feet deep, massed	16,500
U to V, 500 feet sea margin, 100 feet deep, massed	50,000
W to S, 225 feet sea margin, 20 feet deep, massed	5,500
S to X, 350 feet sea margin, 10 feet deep, massed	3,500
Y to Z, 710 feet sea margin, 10 feet deep, massed	7,100
Z to Z^2, 350 feet sea margin, 20 feet deep, massed	7,000
Z^2 to A^2, 125 feet sea margin, 10 feet deep, massed	1,250
A^2 to A^3, 500 feet sea margin, 40 feet deep, massed	20,000
A^3 to B^1, 480 feet sea margin, 15 feet deep, massed	7,200
Total square feet	435,750

making ground for 217,875 seals, bulls, cows, and pups, against a total of 1,200,000 in 1872–1874.

With this enumeration of Novastoshnah we close the list at St. Paul Island, and now turn to the breeding grounds of St. George, merely mentioning the fact, as we do so, that no fur seals breed on Otter Island or Walrus Islet, which are near by. The method in vogue here during the last six or seven years of scraping the margins of the rookeries for killable seals has so harassed and broken up the compact organization of the Reef rookery, as to cause quite a hauling out of breeding seals on Seevitchie Kammen, a small islet less than 900 feet in greatest length, with an average width of less than 200 feet. This rock, as may be seen on my detailed chart of the Reef rookery, lies just south-southeast of the Reef point a few hundred yards (about 1,000 feet). It is a bad place for the location of even a small rookery, since most of its elevation is

only slightly above surf wash in moderate weather, and a storm in the summer or fall would destroy nearly every pup born upon it. It is a small crescentic splintered rock and reef bar, with a little shoulder of gray basalt in its center some 25 or 40 feet only above tide water. The "ears," or wings, which make that odd, half-moon shape of this islet, are simply ice-ground and pushed basaltic bowlders, over which the surf of every storm from the southwest backing around, and to the northeast rolls and breaks completely. In 1872 the fur seal did not breed here; its instinct warned it of this danger to its offspring from sea storms. But, since then, so harassed has it been, that a few hundred families or harems have preferred to risk the chance of a quiet living there, rather than to longer submit to that hustling of those sealing gangs all along the margin of their breeding grounds on the Reef point.

I estimate that some 6,000 or 7,000 breeding seals and their young were hauled out on Seevitchie Kammen this last season of 1890.

ST. GEORGE (1873-74).

[*As it appeared during the summers of 1873-74.*]

St. George is now in order, and this island has only a trifling contribution for the grand total of the seal life; but, small as it is, it is of much value and interest. Certainly Pribilov, not knowing of the existence of St. Paul, was as well satisfied as if he had possessed the boundless universe when he first found it. As in the case of St. Paul Island, I have been unable to learn much here in regard to the early status of the rookeries, none of the natives having any real information. The drift of their sentiment goes to show that there never was a great assemblage of fur seals on St. George; in fact, never as many as there are to-day, insignificant as the exhibit is compared with that of St. Paul. They say that at first the sea lions owned this island, and that the Russians, becoming cognizant of the fact, made a regular business of driving off the "seevitchie" in order that the fur seals might be encouraged to land. Touching this statement, with my experience on St. Paul, where there is no conflict at all between the 8,000 or 10,000 sea lions which breed around on the outer edge of the seal rookeries there, and at Southwest Point, I can not agree to the St. George legend. I am inclined to believe, however (indeed, it is more than probable), that there were a great many more sea lions on and about St. George before it was occupied by men—a hundredfold greater, perhaps—than now: because a sea lion is an exceeding timid, cowardly creature when it is in the proximity of man, and will always desert any resting place where it is constantly brought into contact with him.[1]

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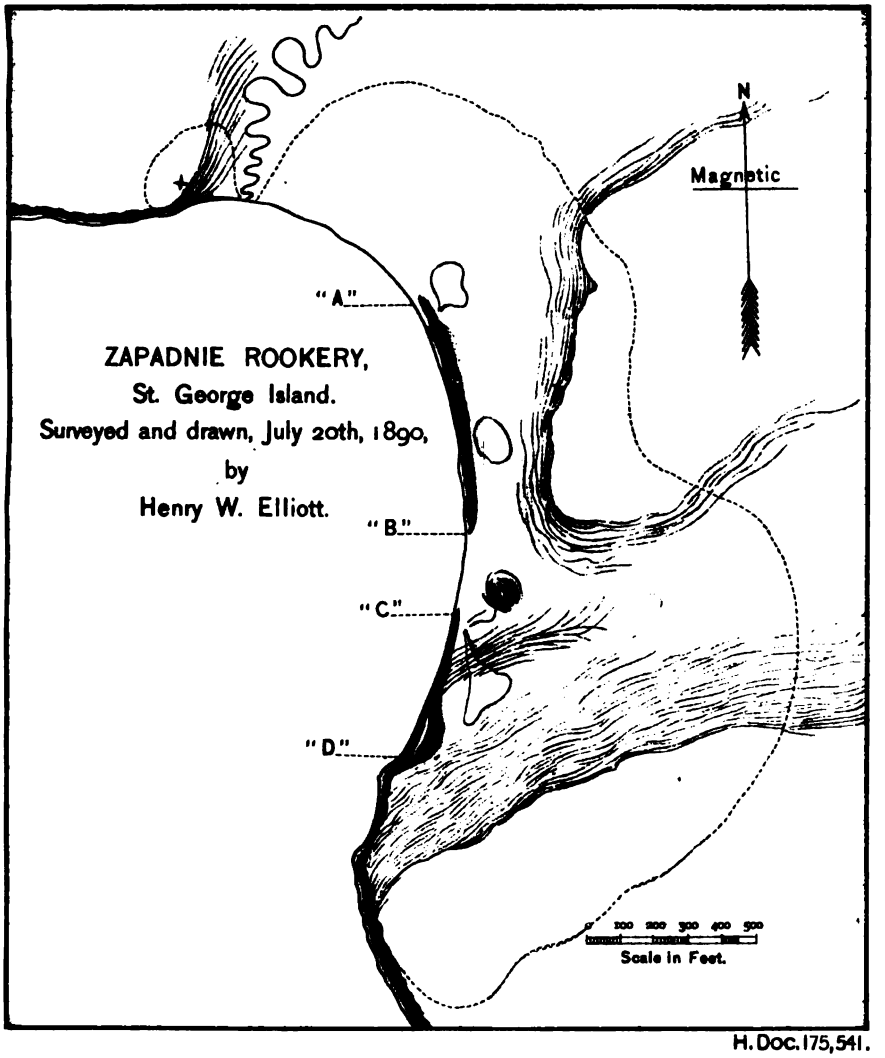
[1]This statement of the natives has a strong circumstantial backing by the published account of Choris, a French gentleman of leisure and amateur naturalist and artist, who landed at St. George in 1820 (July). He passed several days off and on the island. He wrote at short length in regard to the sea lion, saying "that the shores were covered with innumerable troops of sea lions. The odor which arose from them was insupportable. These animals were all the time rutting," etc., yet nowhere does he speak, in the chapter or elsewhere in his volume, of the fur seal on St. George, but incidentally remarks that over on St. Paul it is the chief animal and most abundant. (Voyage Pittoresque au tour du Monde, Iles Aleoutiennes, pp. 12, 13, Pl. XIV, 1822.)

Although this writing of Choris in regard to the subject is brief, superficial, and indefinite, yet I value the record he made, because it is prima facie evidence, to my mind, that had the fur seal been nearly as numerous on St. George then, as it was on St. Paul, he would have spoken of the fact, surely, inasmuch as he was searching for just such items with which to illumine his projected book of travels. The old Russian record as to the relative number of fur seals on the two islands of St. George and St. Paul is clearly and palpably as erroneous for 1820 as I found it to be in 1872-73. No intelligent steps toward ascertaining that ratio were ever taken until I made my survey.



H. Doc. 175, 541.

Area and Position of the breeding Fur-seals, Seasons of 1873-74.
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Hauling Grounds of 1873-74. Now abandoned and Grass grown in 1890.
do. do. 1890.

NORTHEAST POINT OR NOVASTOSHNAH ROOKERY (1872–1874).

[*Its condition and appearance July, 1874.*]

Though this is the last of the St. Paul rookeries which I notice: yet it is so much greater than any other one on the island, or two others for that matter, that it forms the central feature of St. Paul, and in truth presents a most astonishing and extraordinary sight. It was a view of such multitides of amphibians, when I first stood upon the summit of Hutchinson Hill and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me full courage to maintain the truth in regard to this subject.

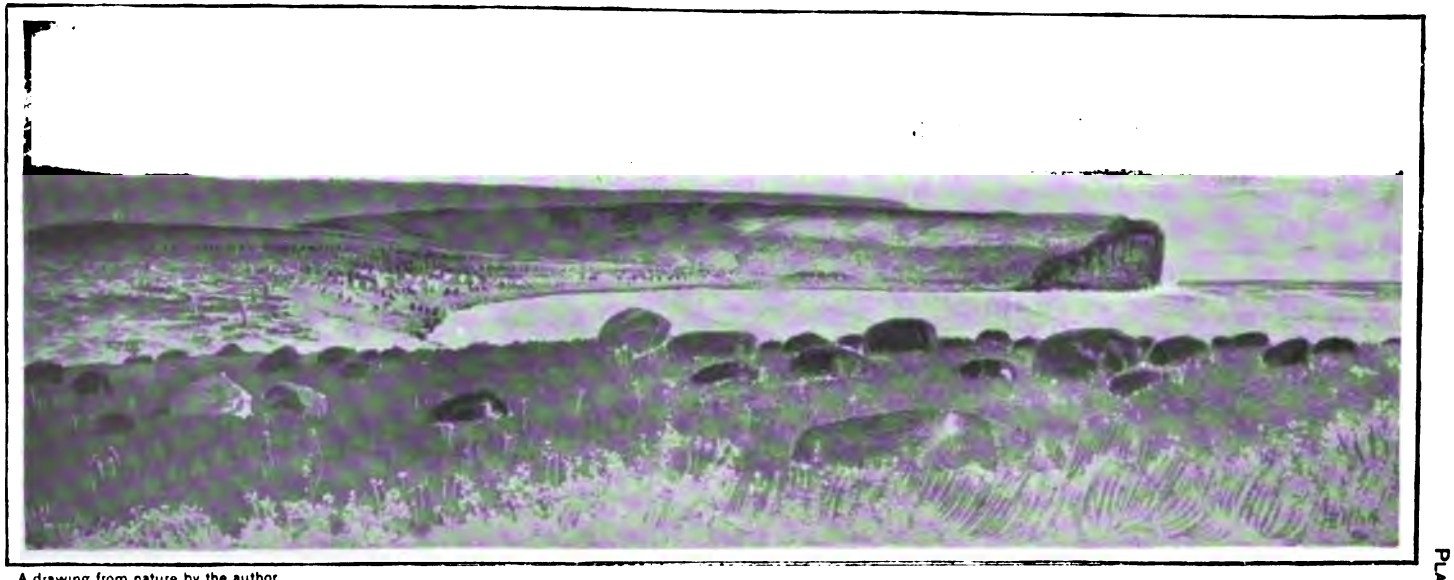
The result of my first survey here, presented such a startling array of superficial area massed over by the breeding seals that I was fairly disconcerted at the magnitude of the result. It troubled me so when my initial plottings were made, and I had worked them out so as to place them tangibly before me, that I laid the whole preliminary survey aside, and seizing upon the next favorable day went over the entire field again. The two plats then, laid side by side, substantially agreed, and I now present the great rookery to the public. It is in itself, as the others are, endowed with its own particular physiognomy, having an extensive sweep, everywhere surrounded by the sea, except at that intersection of the narrow neck of land which joins it to the island. Hutchinson Hill is the foundation of the point; a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner, which is so rough and yet polished so highly by the countless pattering flippers of its visitors, as to leave it entirely bare and bald of every spear of grass or trace of cryptogamic life. The hill is about 120 feet high; it has a rounded summit flecked entirely over by the hollus-chickie, while the great belt of breeding rookery sweeps high up on its seaward flanks, and around right and left for nearly 3½ miles unbroken—an amazing sight in its aggregate, and infinite in its detail.

A picturesque feature, also, of the rookery here is the appearance of those tawny, yellowish bodies of several thousand sea lions which lie in and among the fur seals at the several points designated on the sketch map, though never far from the water. Sea Lion Neck, a little tongue of low basaltic jutting, is the principal corner where the natives take these animals from, when they capture them in the fall for their hides and sinews.[1]

Cross or St. John Hill, which rises near the lake to a height of 60 or 70 feet, and is quite a landmark itself, is a perfect cone of sand entirely covered with a luxuriant growth of *Elymus*. It is growing constantly higher by the fresh deposit brought by wind, and is retained by the annually rising grasses.

At this point it will be noticed there is a salt house: and, here is the killing ground for Northeast Point, where 19,000 or 20,000 holluschickie are disposed of for their skins every season, their carcasses being spread out on the sand dunes between the foot of Cross Hill and Webster's house. A squad of sealers live there during the three or four

[1]The sea lions breed on no one of the other rookeries at this island, the insignificant number that I noticed on Seevitchie Kammin excepted. At Southwest Point, however, I found a small sea lion rookery, but there are no breeding fur seals there. A handful of *Eumetopias* used to breed on Otter Island, but do not now, since it has been necessary to station Government agents there for the apprehension of fur-seal pirates during the sealing season.



A drawing from nature by the author.

ZAPADNIE HAULING GROUNDS AND ROOKERY, SAINT GEORGE ISLAND, JULY 21, 1890.

View looking south, over the rookery and Zapadnie Bay, showing the area of abandoned hauling and breeding grounds as emarginated by the grasses.

PLATE 15.

PLATE 14.

A drawing from nature by the author.

SEAL PUPS PODDING ON ZOLTOI, SAINT PAUL ISLAND, AUGUST AND SEPTEMBER, 1872.

Characteristic movements of the young fur seals when six to eight weeks old; they haul off from the breeding grounds in large bands or pods to sleep and play together. It is during this podding period that they sooner or later come in contact with the water and learn to swim.

at a time, a marine impossibility to effect a landing at Zapadnie suitable for the safe transit of cargo to the steamer.

This 5 miles of the roughest of all rough walks that can be imagined is made by the fur seals in about fourteen to sixteen hours when driven by the Aleuts and the weather is cool and foggy. I have known one Treasury agent who, after making the trip from the village to Zapadnie, seated himself down in the barrabkie there and declared that no money would induce him to walk back the same way that day, so severe is the exercise to one not accustomed to it; but it exhibits the power of land locomotion possessed by the holluschickie.[1]

ZAPADNIE ROOKERY (1890).

[*Its condition and appearance July, 1874.*]

The St. George Zapadnie was a very small edition of the St. Paul Zapadnie in 1872. It is still a small rookery, but relatively has held its own much better than its big namesake during the last seventeen years. I often wondered in 1873, why this little rookery way over here, and all by itself on the south shore, should be the mark of the best hauling of the holluschickie on St. George Island. I now believe that its location is the cause, since the scent and noise of the breeding seals must appeal strongly to the upward-bound bands of holluschickie, as they come en route from the Aleutian passes for St. Paul Island. The south shore of St. George would be the first land met by them, hence the largest and best drives on St. George can always be made here, although the rookery itself is, and always has been, one of the smallest.

Yet, it is the finest lay of seal landing for a breeding ground on the island, since the polished, flat basaltic shelves and cubes that are its chief topographical characteristics could easily receive ten times as many seals as I found there in 1873, or to-day, July 20, 1890. But, for some reason or other, the eligible rookery ground here has never been occupied beyond the beach belt or sea margin. The area in the rear is a superb rocky slope, nearly flat, but well drained. It never had been occupied prior to 1872–73 in so far as I can trace the record, and certainly has not been since.

Upon the accompanying map of this rookery I have also added the hauling grounds, which are all confined to this single spot on the south shore of St. George. There are none on the east shore, and there is no west shore to speak of, owing to the peculiar shape of this island. Each rookery map belonging to St. George must carry also the hauling grounds adjacent and contiguous, since these seal fields over here are on too small a scale to be shown clearly by a general map of this island unless drawn on a vastly larger scale than that which can be successfully employed for St. Paul Island.

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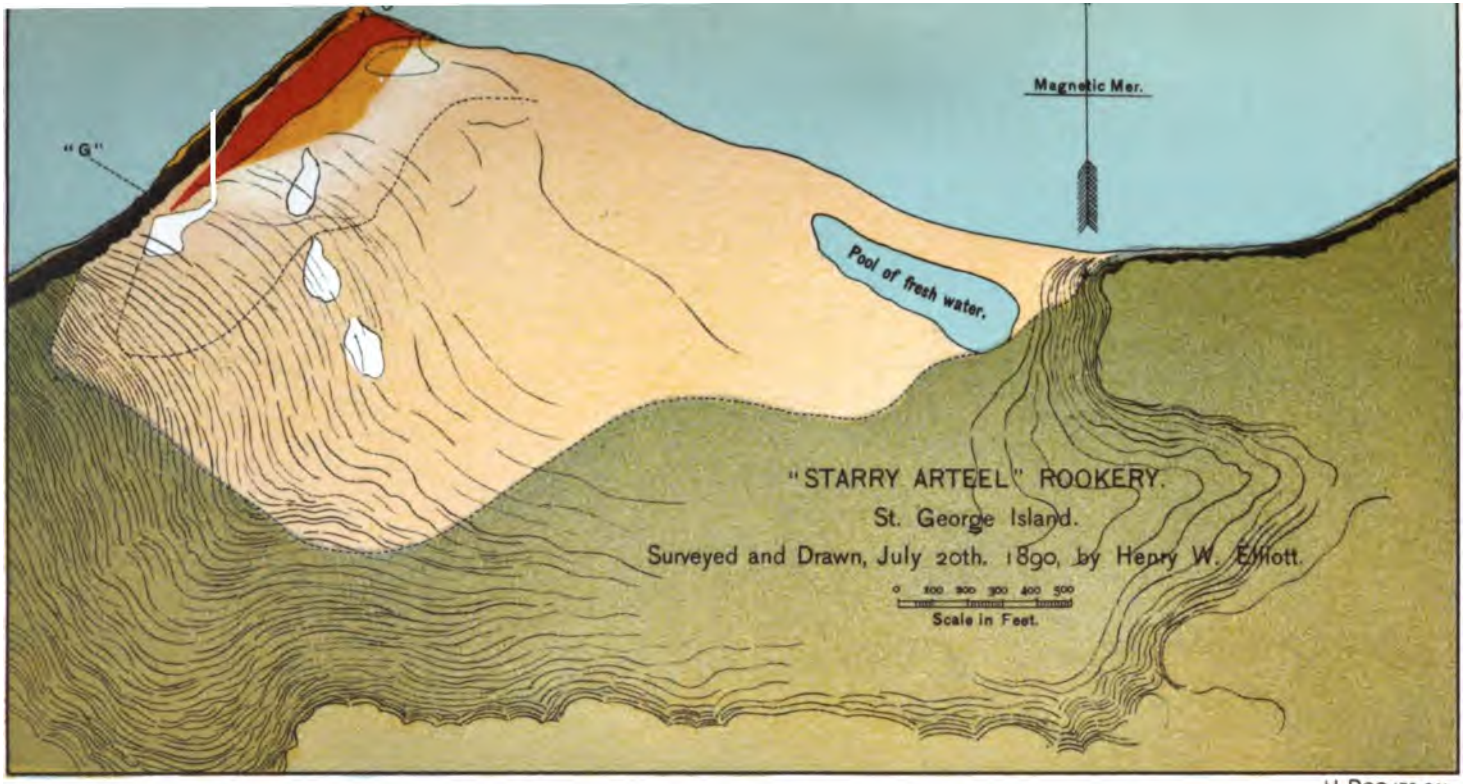
[1]The peculiarly rough character to this trail is given by the large, loose, sharp-edged basaltic bowlders which are strewn thickly over all those lower plateaus that bridge the island between the bluffs at Starry Arteel and the slopes of Ahluckeyak Hill. The summits of the twe broader, higher plateaus east and west, respectively, are comparatively smooth and easy to travel over; and so is the sea-level flat at Zapadnie itself. On the map of St. George a number of very small ponds will be noticed; they are the fresh-water reservoirs of the island. The two largest of these are near the summit of this rough divide. The seal trail from Zapadnie to the village runs just west of them and comes out on the north shore a little to the eastward of the hauling grounds of Starry Arteel, where it forks and unites with that path. The direct line between the village and Zapadnie, though nearly a mile shorter on the chart, is equal to 5 miles more of distance by reason of its superlative rocky inequalities.



H. DOC. 175, 541.

Area and Position of the Breeding Fur Seals. . Seasons of 1873—74.
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Hauling Grounds of the Non-breeding Seals in 1873—74, now abandoned and Grass grown in 1890.
do. do. do. do. 1890.

PLATE 16.

A drawing from nature by the author.

THE NORTH SHORE OF SAINT GEORGE ISLAND, FROM STARRY ARTEEL BLUFFS, JULY 20, 1890.

View looking east over the rookery and hauling grounds of Starry Arteel; the village in the middle distance, and the North Rookery heads just this side of it.

Detailed analysis of survey of Zapadnie (St. George) rookery, July 20, 1890.

[Sea margin extending from A to B and C to D, 1,250 feet.]

	Square feet.
1,250 feet sea margin, from A to B, C to D, with 20 feet average depth, massed.	25,000

making ground for 12,500 seals—bulls, cows, and pups—against a total of 18,000 in 1873–74.

It will be observed, by my tinting on this map of 1890, that in 1873 there was but 600 feet of sea margin to this rookery, but that it had the greater depth of 60 feet, which threw a third more seals into the field then than is seen to-day, with a sea margin twice as great, but no backing to speak of. This great scattering of these breeders along the sea margin here, instead of massing solidly as in 1873, is due to that rough driving by the sealing gangs along the rookery margins during the last six or seven years. This scraping has the decided effect of forcing the outside harems, laying farthest back from the water, down along the edges of the rookery to a spot less exposed to the hustling of the native drivers. That steadily kept up, spreads the rookery out along the water's edge. This again operates badly in still another very significant manner—the doubled extension to the sea margin of a small rookery, like Zapadnie here, brings an unduly increased number of the pups born here every year within the danger line of heavy surf in August and September, before these little fellows can swim well. Therefore, the method of driving as practiced to-day, is actually forcing the exposure of a decreasing life to a fresh and an unwarranted increasing danger of destruction which every August and September gale will surely visit upon it. Such storms are not lacking: and, when they do prevail, thousands and tens of thousands of pups within the reach of their surf-washing violence, are destroyed.

STARRY ARTEEL ROOKERY[1] (1873–74).

[*Its condition and appearance July, 1874.*]

This rookery is the next in order, and it is the most remarkable one on St. George, lying as it does in a bold sweep from the sea up a steeply inclined slope to a point where the bluffs bordering it seaward, are over 400 feet high, the seals being just as closely crowded at the summit of this lofty breeding plat as they are at the water's edge. The whole oblong oval on the side hill, as designated by the accompanying survey, is covered by their thickly covered forms. It is a strange sight, also, to sail under these bluffs with the boat in fair weather for a landing; and, as you walk the beach, over which the cliff wall frowns a sheer 500 feet, there, directly over your head, the craning necks and twisting forms of the restless seals, ever and anon, as you glance upward, appear as if ready to launch out and fall below, so closely and boldly do they press to the very edge of the precipice. There is a low, rocky beach to the eastward of this rookery, over which the holluschickie haul in proportionate numbers, and from which the natives make their drives:

[1] Starry Arteel, or Old Settlement: a few hundred yards to the eastward of the rookery, are the earthen ruins of one of the pioneer settlements in Pribilov's time, and which, the natives say, marks the first spot selected by the Russians for their village after the discovery of St. George in 1786.

coming from the village for this purpose, and directing the seals back in their tracks.[1]

Starry Arteel has 500 feet of sea and cliff margin, with 125 feet of average depth, making ground for 30,420 breeding seals and their young.

STARRY ARTEEL ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

This rookery, I am inclined to believe, is the only one on St. George Island that really did increase in size since my work of 1873. The natives all unite in saying that it "grew larger and larger" until 1878; then it ceased to expand, and during the last four years it has gone into a rapid decline—"worse than any other here except the East rookery; nothing, really nothing, there." In 1874, when on this rookery, in reviewing my survey of 1873, I could not detect any increase or change worthy of note whatever: but, at Zapadnie I thought I found ground for a small increase there of nearly 5,000: still I was not wholly certain of it, inasmuch as the day was very foggy, and I could not entirely trust my compass bearings.

Here, as at Zapadnie, is that undue extension of sea margin for the number of seals occupying the ground, caused by that peculiar driving which has been in vogue on each island ever since the shrinking of the supply of killable seals in 1882. In 1873, this breeding ground of Starry Arteel was a compact oblong oval mass of breeding seals resting on that steep hill slope of volcanic breccia and cement which these seals seem to love so well (happy as it is as to drainage and always free from mud and dust). Then it had but 500 feet of sea and cliff margin, but had an average depth of 125 feet. Within these lines 30,000 breeding seals and young were easily located. To-day it presents a straggling belt of 800 feet of cliff and sea margin, with a scant 40 feet of average depth: upon which a very liberal estimate can not place more than 16,000 animals, old and young.

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[1]Driving the holluschickie on St. George, owing to the relative scantiness of hauling area for those animals there, and consequent small numbers found upon these grounds at any one time, is a very arduous series of daily exercises on the part of the natives who attend to it. Glancing at the map, the marked considerable distance, over an exceedingly rough road, will be noticed between Zapadnie and the village; yet in 1872 eleven different drives across the island, of 400 to 500 seals each, were made in the short four weeks of that season.

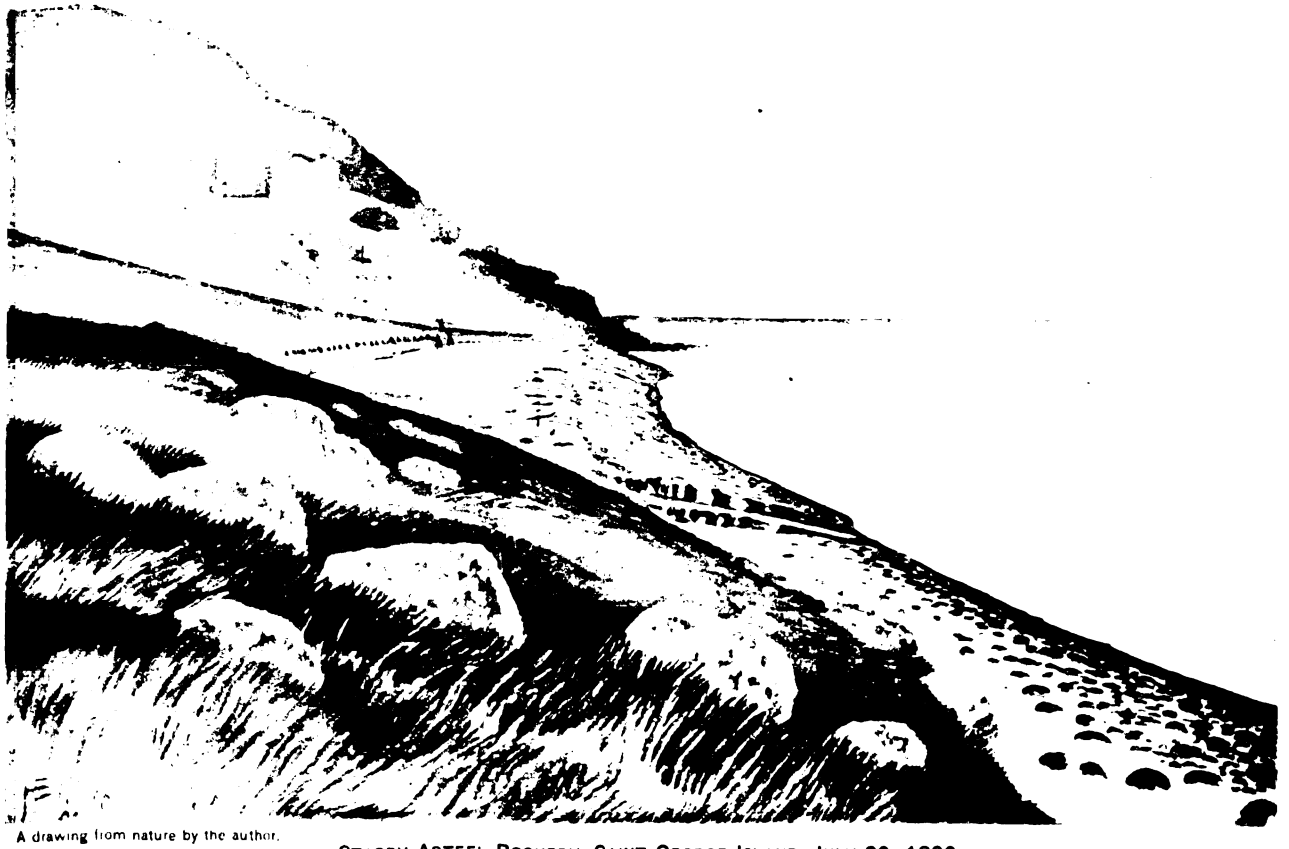
The following table shows plainly the striking inferiority of the seal life, as to the aggregate number, even as far back as 1872 on this island, compared with that of St. Paul:

Rookeries of St. George.

	Number of drives made in 1872.	Number of seals driven.
Zapadnie (between June 14 and July 28)	11	5,194
Starry Arteel (between June 6 and July 29)	14	5,274
North rookery (between June 1 and July 27)	16	4,818
Little Eastern		
Great Eastern (between June 5 and July 28)	16	9,714

The same activity then in "sweeping" the hauling grounds of St. Paul would have brought in ten times as many seals and the labor have been vastly less; the driving at St. Paul was generally done with an eye to securing each day of the season only as many as could be well killed and skinned on that day, according as it was warm or cool.

PLATE 17.

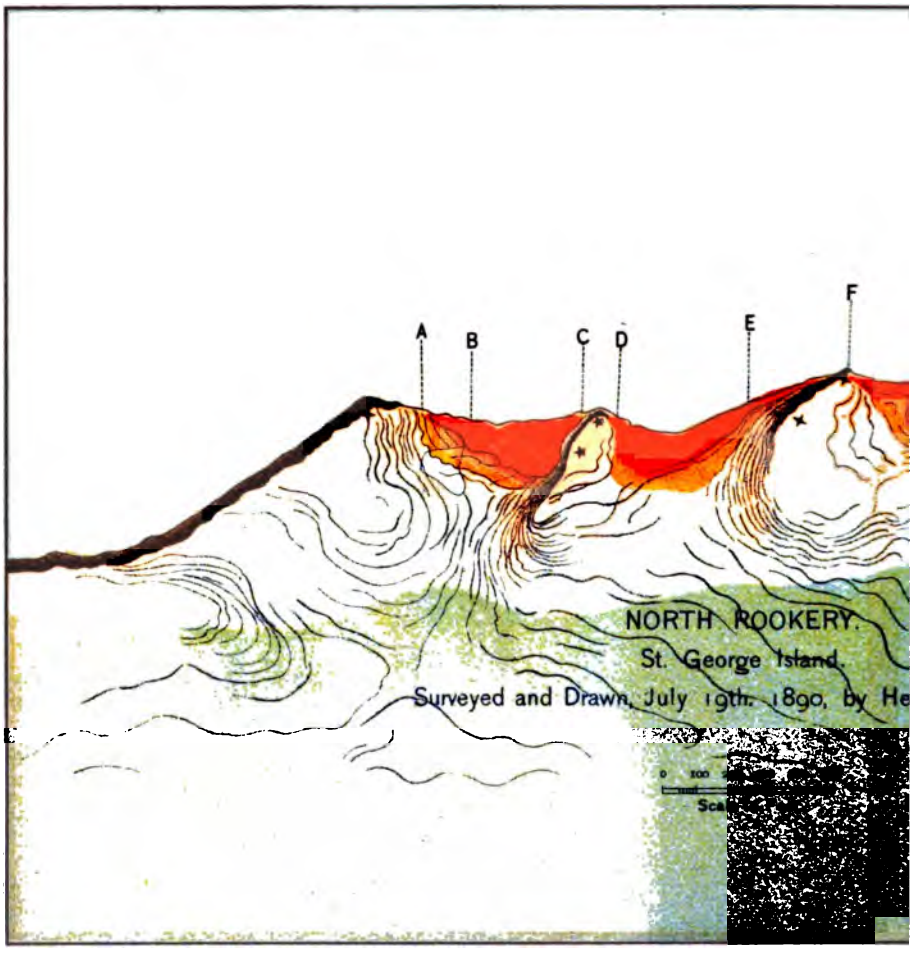


A drawing from nature by the author.

STARRY ARTEEL ROOKERY, SAINT GEORGE ISLAND, JULY 20, 1890.

View looking west, over the desolate hauling grounds. Natives "cutting out a drive." This foreground was the site of the first settlement made by the Russians on the island, July 11, 1786; hence the name of the place, "Starry Arteel," or "Old Settlement."

1



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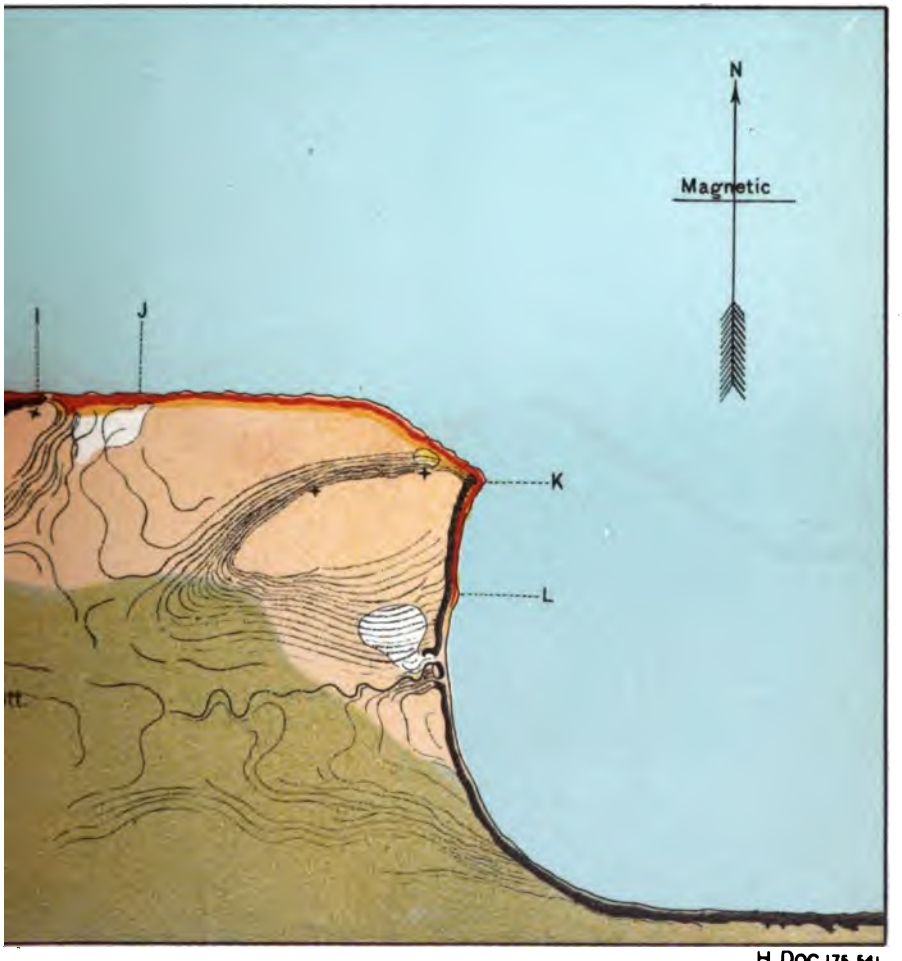

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ons of 1873 — 74.
1890.
— 74, now abandoned and Grass grown in 1890.

Detailed analysis of the survey of Starry Arteel rookery, July 20, 1890.

[Sea and cliff margin beginning at O and ending at G, 800 feet.]

	Square feet.
800 feet sea and cliff margin between G and O, with 40 feet average depth, massed	32,000

making ground for 16,000 seals—bulls, cows, and pups—against a total in 1873 of 30,420.

This rookery, East, and Zapadnie are the only ones on St. George which have, thus far, been landed upon and raided by seal pirates. Three attempts have been made here, but only one at Zapadnie. The damage done was insignificant, since the marauders were detected before they had fairly got to work, and driven off by the natives and officers of the Government.

NORTH ROOKERY (1873-74).

[*Its condition and appearance July, 1890.*]

Next in order, and half a mile to the eastward, is this breeding ground, which sweeps for 2,750 feet along and around the sea front of a gently sloping plateau,[1] being in full sight of and close to the village. It has a superficial area occupied by 77,000 breeding seals and their young. From this rookery to the village, a distance of little more than a quarter of a mile, the holluschickie are driven, which are killed for their skins, on the common track or seal-worn trail, that not only the "bachelors" but ourselves travel over when en route to or from Starry Arteel and Zapadnie. It is a broad, hard-packed erosion through the sphagnum and across the rocky plateaus; in fact, a regular seal road, which has been used by the drivers and victims during the last eighty or ninety years. The fashion on St. George, in this matter of driving seals, is quite different from that on St. Paul. To get their maximum quota of 25,000 annually it is necessary for the natives to visit every morning, the hauling ground of each one of these four rookeries on the north shore, and bring what they may find back with them for the day.[2]

[1] I should say "a gently sloping and alternating bluff plateau." Two thousand feet are directly under the abrupt faces of low cliffs, while the other 750 feet slope down gradually to the water's edge. These narrow cliff belts of breeding fur seals might be properly styled "rookery ribbons."

[2] The original text of the existing law for the protection of the seal islands provides that 100,000 seals which may be annually taken from them shall be proportioned by killing 75,000 on St. Paul and 25,000 on St. George. This ratio was based evidently upon the published tables of Veniaminov, which, if accurate, would clearly show that fully one-third as many seals repaired to the smaller island as to the larger one: and, until I made my surveys, 1872-1874, it was so considered by all parties interested. The fact, however, which I soon discovered, is that St. George receives only one-eighteenth of the whole aggregate of fur-seal visitation peculiar to the Pribilov Islands, St. Paul entertaining the other seventeen parts.

This amazing difference, in the light of prior knowledge and understanding, caused me, on returning to Washington in October, 1873, to lay the matter before the Treasury Department and ask that the law be so modified that, in the event of abnormally warm killing seasons, or other reasons, a smaller number might be taken from St. George with a corresponding increase at St. Paul. For unless this was done it might become at any season a matter of great hardship to secure 25,000 killable seals on St. George, in the short period allotted by law. The Treasury Department, while fully concurring in my representations, seemed to doubt its power to thus modify the law. I carried the question before Congress, January, 1874, and secured from that body an amendment of the act of July 1, 1870 (act approved March 24, 1874), which gives the Secretary of the Treasury full discretion in the matter: and fixes the hitherto inflexible ratio of killing on each island upon a sliding scale, as it were, for adjustment from season to season, upon a more intelligent understanding of the subject; and, also, this amendatory act gives the Secretary of the Treasury the power to fix the legal limit of killing annually, as the case may require.

As the law is now amended, the killing can be sensibly adjusted each season by the relative number of seals on the two islands: this total will vary decidedly on St. George according as it may be abnormally dry and warm when the period for driving the holluschickie is at hand, or other causes.

NORTH ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

I came upon this breeding ground to-day, July 19, 1890, after an absence of just sixteen years. I find the topography unchanged; the hauling grounds all grass-grown, and the usual flowering plants which seem to follow (on all of these declining rookeries) the abandonment of hitherto polished rock and hard-swept soil traveled over and laid upon by the seals. The breeding animals on the several areas of this rookery are in the usual form, and characteristic of those which I have described on St. Paul—the same scanty supply of old bulls; no young bulls on the rookery or outside at the water's edge; large scattered harems and every evidence of imperfect service. In all these forms, precisely as they are over on St. Paul.

Yet this, the chief rookery of St. George, which held 76,250 breeding animals and their young in 1874, has suffered a loss of only one-half of its cows and pups—but, the bulls, fully five-sevenths of them are missing. This rookery was the largest on St. George in 1874. It has been so ever since, and is to-day; but, large as it was, there was only one on St. Paul smaller in 1874, the Lagoon rookery: (Nah Speel we can not count). However, to-day there is still another one on St. Paul smaller, and that is Ketavie, though it was twice as large as this North rookery in 1874.

It is an admirable point of seal ground, well drained and free from muddy pools during rain storms. It is in full sight of the village, and only a short half-mile walk away.

Detailed analysis of the survey of North rookery, July 19, 1890.

[Sea margin begins at a and ends at l, 3,366 feet.]

	Square feet.
150 feet sea margin, from a to b, with 15 feet average depth, massed	2,250
300 feet sea margin, from b to c, with 60 feet average depth, massed	18,000
95 feet sea margin, from c to d, with no depth (a few scattered seals.)	
245 feet sea margin, from d to e, with 60 feet average depth, massed	20,700
250 feet sea margin, from e to f, with 10 feet average depth, massed	2,500
186 feet sea margin, from f to g, with 12 feet average depth, massed	2,232
220 feet sea margin, from g to h, with 60 feet average depth, massed	13,200
240 feet sea margin, from h to i, with 12 feet average depth, massed	2,880
280 feet sea margin, from i to j, with 12 feet average depth, massed	3,360
1,300 feet sea margin, from j to l, with 10 feet average depth, massed	13,000
Total square feet	77,122

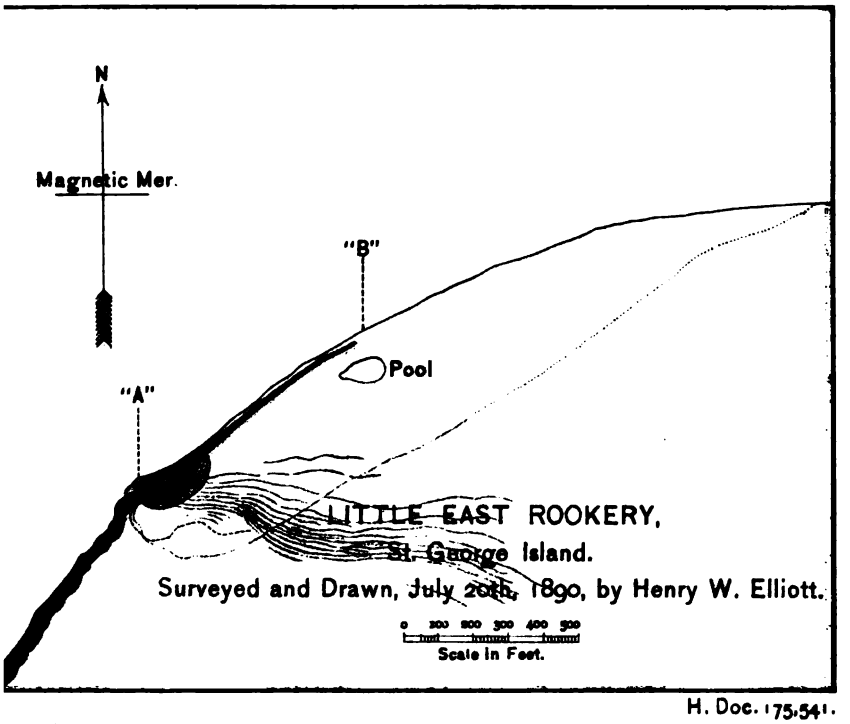
making ground for 38,561 seals—bulls, cows, and pups—against a total of 76,250 in 1873–74.

LITTLE EASTERN ROOKERY[1] (1873–74).

[*Its condition and appearance July, 1874.*]

From the village to the eastward about half a mile again, is a little eastern rookery, which lies on a low, bluffy slope and is not a piece of ground admitting of much more expansion. It has superficial area for the reception of nearly 13,000 breeding seals and their young.

[1] The site of this breeding ground, and that of the marine slope of the killing grounds to the east of the village on this island, is where sea lions held exclusive possession prior to their driving off by the Russians, so the natives affirm. The only place on St. George now, where the *Eumetopias* breeds, is that one indicated on the general chart between Garden Cove and Tolstoi Mees.



H. Doc. 175,541.

Area and Position of the Breeding Fur-Seals, Seasons of 1873-74.
do. do. do. do. do. 1890.
Abandoned Hauling Grounds of 1873-74. Now Grass grown in 1890.
and no Seals hauled here outside of the Rookery line in 1890.

PLATE 18.

A drawing from nature by the author.

LOOKING DOWN UPON THE EAST ROOKERY, SAINT GEORGE ISLAND.
Viewed from the cliff slope above the sea lions, July 20, 1890.

LITTLE EASTERN ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

This was not much of a rookery in 1873–74, and although it has fallen away in accord with the general diminution of the seal life on these islands, yet it has held its own proportionately much better than many others. The most striking evidence of desolation is the grassing solidly over, rank and luxuriant, of the hauling grounds in its rear and to the eastward, which were so well polished off by the restless flippers of young male seals in 1873–74. Then these hauling grounds were not driven from much; the seals were practically undisturbed, and when a drive was made the seals were always merged into the larger drive from the Great Eastern.

Detailed analysis of the survey of Little Eastern rookery July 20, 1890.

[Sea margin beginning at A and ending at B, 800 feet.]

	Square feet.
800 feet sea margin, from A to B, with 12 feet average depth, massed	9,600

Making ground for 4,800 seals—bulls, cows, and pups—against a total of 13,000 in 1873–74.

THE GREAT EASTERN (1873-74).

[*Its condition and appearance July, 1874.*]

This is the fifth, and last rookery that we find on St. George. It is an imitation, in miniature, of Tolstoi on St. Paul, with the exception of there being no parade ground in the rear of any character whatever. It is from the summit of the cliffs, overlooking the narrow ribbon of breeding seals right under them, that I have been able to study the movements of the fur seal in the water to my heart's content; for, out and under the water, the rocks to a considerable distance are covered with a whitish algoid growth that renders the dark bodies of the swimming seals and sea lions as conspicuous as is the image thrown by a magic lantern of a silhouette on a screen prepared for its reception.[1] The low, rocky flats around the pool to the westward and northwest of the rookery seemed to be filled up with a muddy alluvial wash that the seals do not favor, hence nothing but holluschickie range round about them.

[1] The algoid vegetation of the marine shores of these islands is one that adds a peculiar charm and beauty to their treeless, sunless coasts. Every kelp bed that floats raft-like in Bering Sea, or is anchored to its rocky reefs, is fairly alive with minute sea shrimps, tiny crabs, and little shells, which cling to its masses of interwoven fronds or dart in ceaseless motion through, yet within, its interstices. It is my firm belief that no better base of operations can be found for studying marine invertebrata than is the post of St. Paul or St. George. The pelagic and the littoral forms are simply abundant beyond all estimation within bounds of reason. The phosphorescence of the waters of Bering Sea surpasses in continued brilliant illumination anything that I have seen in southern and equatorial oceans. The crests of the long unbroken line of breakers on Lukannon Beach looked to me, one night in August, like so many flashings of lightning between Tolstoi Mees and Lukannon Head, as the billows successively rolled in and broke. The seals swimming under the water here on St. George and beneath the Black Bluffs streaked their rapid course like comets in the sky, and every time their dark heads popped above the surface of the sea they were marked by a blaze of scintillant light.

THE GREAT EASTERN ROOKERY (1890).

[*Its condition and appearance July, 1890.*]

In 1873–74, this breeding ground ranked third in the list of five that were found on the island of St. George. To-day, it seems to have been the heaviest loser. It has literally dropped down to a mere skeleton of its form in my early survey. That extended rocky flat from which the rookery ground proper gently rises on the hill slope, was one of the most attractive hauling grounds for the holluschickie on St. George, sixteen years ago; now, its surface is covered with a most luxuriant turf—it looks like a Kentucky blue-grass meadow!

I observed here in 1873–74 that a good many sea lions hauled out on the beach curve, right under the rookery bluffs. These animals are very much more numerous now, than then: not less than 500 of them being lazily extended just above surf-wash here as I made my survey (July 20, 1890), their huge yellow bodies hauled out like Mississippi River steamboats on the levee at St. Louis.

Detailed analysis of the survey of Great Eastern rookery, July 20, 1890.

[Sea margin beginning at e and ending at f, 1,230 feet; sea margin beginning at b and ending at a 2,040 feet.]

	Square feet.
2,040 feet sea margin, a to b, with a straggling average depth of 5 feet (a very liberal estimate)	10,000
200 feet sea margin, f to g, with 30 feet average depth, massed	6,000
1,000 feet sea margin, g to e, with a straggling average depth too thin for calculation, allowed	2,000
Total square feet	18,000

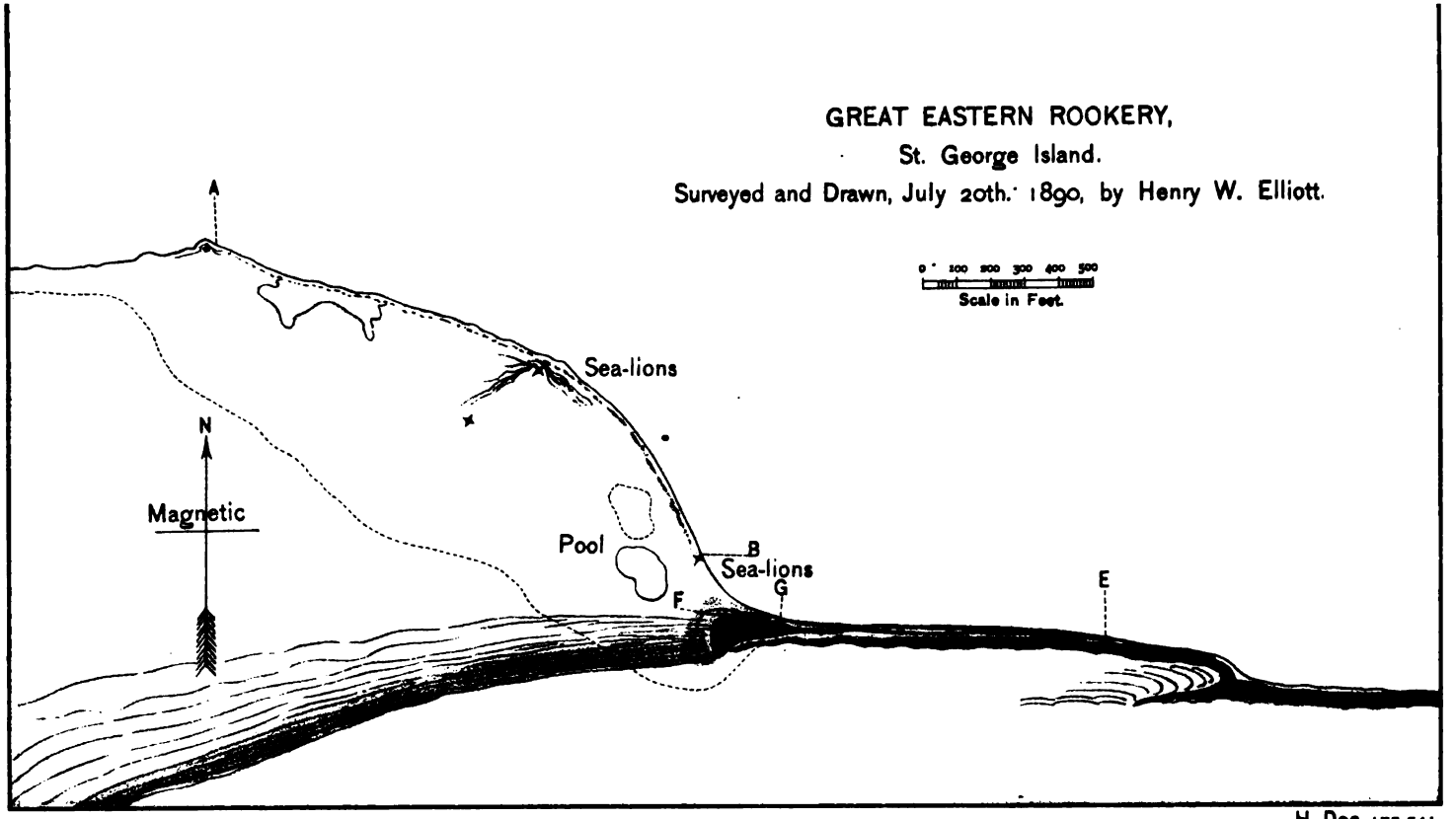
making ground for 9,000 seals—bulls, cows, and pups—against a total of 25,250 in 1873–74.

I think that this rookery presents the most eloquent illustration of that ruin and demoralization wrought by the present order of scraping the breeding lines on all the rookeries in getting the daily "drives" of killable seals. It presents itself in this plain manner: In 1873 there was only 900 feet of rookery sea margin here; 200 feet of this total was a solid massing of breeding seals, from the water upon the hillside, as shown by the 1874 tint on the accompanying map. It was 200 feet deep and contained 20,000 of the 25,000 seals, all told, that then existed at this point. To-day there is 3,275 feet of rookery sea margin here: a straggling, ragged belt, not even a full harem's width or depth, except under that side-hill expansion between *f* and *g*, where there is instead of the 200 feet of massing cited above, only 30 feet of average depth.

Thus it becomes entirely plain, upon the least study of this subject, that the present order of raking and dinning, by which the holluschickie are started out from the shelter of these breeding grounds also starts the outlying cows and bulls and hustles them off and down to the water's edge. This, repeated day after day, has created that long extension of over 3,000 feet to my sea margin of 1873–74 on this rookery, while the seals themselves are barely one-third the number that they were at first record.

RECAPITULATION OF THE ESTIMATES OF NUMBERS OF SEALS.

Below is a brief recapitulation of those figures made from my surveys of the area and position of the breeding grounds of St. Paul Island between the 10th and 18th of July, 1872: confirmed and revised to that date in 1874; on St. George Island, July 12 to 15, 1873: confirmed and revised to that date in 1874. Opposed to these tables are my figures made July 10 to 16, 1890, on St. Paul Island, and July 19 and 20, 1890, on St. George.



H. Doc. 175,541.

Area and Position of the Breeding Fur-seals, Seasons of 1873-74.
do. do. do. do. do. 1890.
Hauling Grounds of the Non breeding Seals in 1873-74, now abandoned and Grass grown in 1890.
do. do. do. do. 1890.

Breeding grounds of the fur seal on St. Paul Island, July 10–18, 1872–1874.

Rookery.	Seals, male, female, and young.
Reef rookery has 4,016 feet of sea margin, with 150 feet of average depth, making ground for	301,000
Garbotch rookery has 3,660 feet of sea margin, with 100 feet of average depth, making ground for	183,000
Lagoon rookery has 750 feet of sea margin, with 100 feet of average depth, making ground for	37,000
Nah Speel rookery has 400 feet of sea margin, with 40 feet of average depth, making ground for	8,000
Lukannon rookery has 2,270 feet of sea margin, with 150 feet of average depth, making ground for	170,000
Keetavie rookery has 2,200 feet of sea margin, with 150 feet of average depth, making ground for	165,000
Tolstoi rookery has 3,000 feet of sea margin, with 150 feet of average depth, making ground for	225,000
Zapadnie rookery has 5,880 feet of sea margin, with 150 feet of average depth, making ground for	441,000
Polavina rookery has 4,000 feet of sea margin, with 150 feet of average depth, making ground for	300,000
Novastoshnah or Northeast Point has 15,840 feet of sea margin, with 150 feet of average depth, making ground for	1,200,000
A grand total of breeding seals and young for St. Paul Island in 1874 of	3,030,000

Breeding grounds of the fur seal on St. Paul Island, July 10–16, 1890.

Rookery.	Seals, male, female, and young.
Reef rookery has 4,300 feet of sea margin, with 65½ feet average depth, making ground for	140,500
Garbotch rookery has 2,400 feet of sea margin, with 70½ feet average depth, making ground for	84,802
Lagoon rookery has 1,500 feet of sea margin, with 12 feet average depth, making ground for	9,000
Nah Speel (has disappeared).	
Lukannon rookery has 2,050 feet of sea margin; with 60½ feet average depth, making ground for	72,500
Keetavie rookery has 1,700 feet of sea margin, with 34 feet average depth, making ground for	28,000
Tolstoi rookery has 2,800 feet of sea margin, with 44½ feet average depth, making ground for	62,400
Zapadnie rookery has 7,200 feet of sea margin, with 33½ feet average depth, making ground for	121,200
Polavina rookery has 2,255 feet of sea margin, with 126½ feet average depth, making ground for	142,250
Novostoshnah or Northeast Point has 11,435 feet of sea margin, with 37½ feet of average depth, making ground for	217,875
A grand total of breeding seals and young for St. Paul Island in 1890 of	878,532

Breeding grounds of the fur seal on St. George Island, July 12–15, 1873–74.

Rookery.	Seals, male, female, and young.
Zapadnie rookery has 600 feet of sea margin, with 60 feet of average depth, making ground for	18,000
Starry Arteel rookery has 500 feet of sea margin, with 125 feet of average depth, making ground for	30,420
North rookery has 750 feet of sea margin, with 150 feet of average depth, and 2,000 feet of sea margin, with 25 feet of average depth; making ground in all for	77,000
Little Eastern rookery has 750 feet of sea margin, with 40 feet of average depth, making ground for	13,000
Great Eastern rookery has 600 feet of sea margin, with 60 feet of average depth, making ground for	25,000
A grand total of the seal life for St. George Island breeding seals and young of	163,420
Grand total for St. Paul Island breeding seals and young of	3,030,000
Grand sum total for the Pribilov Islands (seasons of 1872–1874) breeding seals and young	3,193,420

Breeding grounds of the fur seal on St. George Island, July 19–20, 1890.

Rookery.	Seals, male, female, and young.
Zapadnie rookery has 11,250 feet of sea margin, with 20 feet average depth, making ground for	12,250
Starry Arteel rookery has 800 feet of sea margin, with 40 feet average depth, making ground for	16,000
North rookery has 2,066 feet of sea margin, with 31 feet average depth, and 1,300 feet of sea margin, with 10 feet of average depth, making ground for	38,561
Little Eastern rookery has 800 feet of sea margin, with 12 feet average depth, making ground for	4,800
Great Eastern rookery has 200 feet of sea margin, with 30 feet average, depth, 2,040 feet of sea margin, with 5 feet average depth, making ground for	9,000
A grand total of the seal life for St. George Island breeding seals and young of	80,861
Grand total for St. Paul Island breeding seals and young of	878,532
Grand sum total for the Pribilov Islands (season of 1890) breeding seals and young	959,393

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Upon this same basis of estimation,[1] less than 300,000 pups were born upon the Pribilov rookeries last year, 1889, but not more than 70,000 to 80,000 of them returned to these islands in 1890, *since their natural enemies are as numerous and as active as ever in the sea*, while the surplus store of seal life upon which these enemies drew in 1872, as they draw now, has been rapidly diminishing during the last six years. Touching this question in 1874, I said then:

These fur seals of the Pribilov group, after leaving the islands in the autumn and early winter, do not visit land again until the time of their return in the following spring and early summer to these same rookery and hauling grounds, unless they touch, as they are navigating their lengthened journey back, at the Russian Copper and Bering islands, 700 miles to the westward of the Pribilov group. They leave the islands by independent squads, each one looking out for itself. Apparently all turn by common consent to the south, disappearing toward the horizon, and are soon lost in the vast expanse below, where they spread themselves over the entire North Pacific as far south as the forty-eighth and even the forty-seventh parallels of north latitude. Over the immense area between Japan and Oregon doubtless many extensive submarine fishing shoals and banks are known to them. At least it is definitely understood that Bering Sea does not contain them long when they depart from the breeding rookeries and the hauling grounds therein. While it is carried in mind that they sleep and rest in the water with soundness and with the greatest comfort on its surface, and that even when around the land during the summer they frequently put off from the beaches to take a bath and a quiet snooze just beyond the surf, we can readily agree that it is no inconvenience whatever—the reproductive functions having been discharged and their coats renewed—for them to stay the balance of the time in their most congenial element, the briny deep.

That these animals are preyed upon extensively by killer whales[2] (*Orca gladiator*), and by sharks,[3] and probably other submarine foes now unknown, is at once evident, for were they not held in check by some such cause they would, as they exist to-day on St. Paul, quickly multiply, by arithmetical progression, to so great an extent that the island, nay Bering Sea itself, could not contain them. The present annual killing of 100,000 out of a yearly total of over 1,000,000 males does not, in an appreciable degree, diminish the seal life or interfere in the slightest with its regu-

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be put, and to give the seals the full benefit of every doubt. Surely, I have clearly presented the case, and certainly no one will question the premises after they have studied the habit and disposition of the rookeries. Hence it is a positive and tenable statement that no danger of the slightest appreciable degree of injury to the interests of the Government on the seal islands of Alaska exists as long as the present law protecting it and the management executing it continues.

[1] Right at this point, in 1890, I realize the paramount importance of keeping a much larger surplus male life in reserve than I did in 1874. I see its necessity now: by reducing the male life to the figures which I thought were safe in 1874, I would only prevent that constant fighting among the sires on the rookery, *which is absolutely necessary for the best perpetuation of the race*—that struggle of the fittest to survive as the progenitors of the herd. Man can not interfere here with these wildest of wild animals: animals which he can not feed or control in the slightest degree, he can not breed as he can cattle, sheep, or hogs.

[2] *Orca gladiator.*—While revolving this particular line of inquiry in my mind when on the ground and among the seals, I involuntarily looked constantly for some sign of disturbance in the sea which would indicate the presence of an enemy; and, save seeing a few examples of the *Orca*, I never detected anything. But the killer whale is common here: it is patent to the most casual eye, because it is the habit of this ferocious cetacean to swim so closely at the surface as to show its peculiar sharp dorsal fin high above the water. Possibly a very superficial observer could and would confound the long, trenchant fluke of the *Orca* with the stubby node upon the spine of the humpback whale, which that animal exhibits only when it is about to dive. Humpbacks feed around the islands, but not commonly—they are the exception. They do not, however, molest the seals in any manner whatever; and little squads of these pinnipeds seem to delight themselves by swimming in endless circles around and under the huge bodies of those whales, frequently leaping out and entirely over the cetacean's back! as witnessed on one occasion by myself and the crew of the *Reliance*, off the coast of Kadiak, June, 1874.

[3] *Somniosus microcephalus.*—Some of these sharks are of very large size, and when caught by the Indians of the northwest coast, basking or asleep on the surface of the sea, they will, if transfixed by the natives' harpoons, take a whole fleet of canoes in tow and run swiftly with them several hours before exhaustion enables the

ıar, sure perpetuation on the breeding grounds every year. We may, therefore, properly look upon this aggregate of 4,000,000, or 5,000,000 of fur seals, as we see them every season on these Pribilov Islands, as the maximum limit of increase assigned to them by natural law. The great equilibrium which nature holds in life upon this earth must be sustained at St. Paul as well as elsewhere.

Think of the enormous food consumption of these rookeries and hauling grounds when 5,000,000 seals ranged the Pacific Ocean and Bering Sea! I said in 1881—[Mon. Seal Islands of Alaska.]

What an immense quantity of finny prey must pass down their voracious throats as every year rolls by. A creature so full of life, strung with nerves, and muscles like bands of steel, can not live on air or absorb it from the sea. Their food is fish to the practical exclusion of all other diet. I have never seen them touch, or disturb with the intention of touching it, one solitary example in the flocks of water fowl which rest upon the surface of the water all about the islands. I was especially careful in noting this, because it seemed to me that the canine armature of their mouths must suggest flesh for food at times as well as fish; but fish we know they eat. Whole windrows of the heads of cod and wolf fishes, bitten off by these animals at the nape, were washed up on the south shore of St. George during a gale in the summer of 1873. This pelagic decapitation evidently marked the progress and the appetite of a band of fur seals to the windward of the island, as they passed into and through a stray school of these fishes.

How many pounds per diem is required by an adult seal, and taken by it when feeding, is not certain in my mind. Judging from the appetite, however, of kindred animals, such as sea lions fed in confinement at Woodward's Gardens, San Francisco, I can safely say that 40 pounds for a full grown fur seal is a fair allowance, with at least 10 or 12 pounds per diem to every adult female, and not much less, if any, to the rapidly growing pups and young holluschickie. Therefore, this great body of 4,000,000 and 5,000,000 of hearty, active animals which we know on the seal islands, must consume an enormous amount of such food every year. They can not average less than 10 pounds of fish each per diem, which gives the consumption, as exhibited by their appetite, of over 6,000,000 tons of fish every year. What wonder then that nature should do something to hold these active fishermen in check.[1]

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savages to finally dispatch them. A Hudson Bay trader, William Manson (at Fort Alexander, in 1865), told me that his father had killed one in the smooth waters of Millbank Sound which measured 24 feet in length, and its liver alone yielded 36 gallons of oil. The *Somniosus* lays motionless for long intervals in calm waters of the North Pacific, just under and at the surface, with its dorsal fin clearly exposed above. What havoc such a carnivorous fish would be likely to effect in a "pod" of young fur seals can be better imagined than described.

The following sharks probably prey upon the fur seals and fur-seal pups in the North Pacific Ocean:

Heptranchias maculatus, Shovel-nosed Shark.
Hexanchus corinus, Cow Shark.
Cetorhinus maximus, Ground Shark or Basking Shark
Carcharias glaucus, Blue Shark.
Somniosus microcephalus, Sleeper or Basking Shark.

These species range from Monterey Bay northward; the range of *Cetorhinus* and *Somniosus* is to the Artic seas, the others do not (?) go so far north.

I should think that the *Cetorhinus* is the most destructive. If the pups get down well within the range of the blue shark, it would also be one of their worst enemies.

[1] When, however, the fish retire from spawning here, there, and everywhere over these shallows of Alaska and the Northwest Coast, along by the end of September to 1st of November every year, I believe that the young fur seal, in following them into the depths of the great Pacific, must have a really arduous struggle for existence, unless it knows of fishing banks unknown to us. The yearlings, however, and all above that age, are endowed with sufficient muscular energy to dive rapidly in deep soundings and to fish with undoubted success. The pup, however, when it goes to sea, 5 or 6 months old, is not lithe and sinewy like the yearling; it is podgy and fat, a comparative clumsy swimmer, and does not develop, I believe, into a good fisherman until it has become pretty well starved after leaving the Pribilovs. I must not be understood as saying that fish alone constitute the diet of the Pribilov pinnipeds. I know that they feed to a limited extent upon crustaceans and upon the squid (*Lologo*), also eating tender algoid sprouts. I believe that the pup seals live for the first five or six months at sea largely, if not wholly, upon crustaceans and squids. They are not agile enough, in my opinion, to fish successfully in any great degree when they first depart from the rookeries.

During the winter solstice—between the lapse of the autumnal and the verging of the vernal equinoxes—in order to get this enormous food supply, the fur seals are necessarily obliged to disperse over a very large area of fishing ground, ranging throughout the North Pacific, 5,000 miles across between Japan and the Straits of Fuca. In feeding they are brougl t to the southward all this time, and as they go they come more and more in contact with those natural enemies peculiar to the sea of these southern latitudes, which are almost strangers and are really unknown to the waters of Bering Sea; for I did not observe, with the exception of ten or twelve perhaps, certainly no more, killer whales, a single marine disturbance or molestation during the three seasons which I passed upon the islands that could be regarded in the slightest decree inimical to the peace and life of the *Pinnipedia;* and thus, from my observation, I am led to believe that it is not until they descend well to the south of the Aleutian Islands and in the North Pacific, that they meet with sharks to any extent, and are diminished except by the butchery of killer whales in Bering Sea.

The young fur seals going out to sea for the first time, and following in the wake of their elders, are the clumsy members of the family. When they go to sleep on the surface of the water they rest much sounder than the others; and their alert and wary nature, which is handsomely developed ere they are two seasons old, is in its infancy. Hence I believe that vast numbers of them are easily captured by marine foes as they are stupidly sleeping or awkwardly fishing.

With reference to the amount of ground covered by the seals when first discovered by the Russians, I have examined every foot of the shore line of both islands where the bones and polished rocks, etc., might be lying on any deserted areas. Since then, after carefully surveying the new ground now occupied by the seals and comparing this area with that which they have deserted, I feel justified in stating that for the last twelve or fifteen years at least the fur seals on these islands have not diminished, nor have they increased as a body to any noteworthy degree; and throughout this time the breeding grounds have not been disturbed except at that brief but tumultuous interregnum during 1868, and they have been living since in a perfectly quiet and natural condition.

CAN THE NUMBER BE INCREASED?

What can be done to promote their increase? We can not cause a greater number of females to be born every year than are born now; we do not touch or disturb these females as they grow up and live, and we never will if the law and present management is continued. We save double—we save more than enough males to serve; nothing more can be done by human agency. It is beyond our power to protect them from their deadly marine enemies as they wander into the boundless ocean searching for food.

In view, therefore, of all these facts I have no hesitation in saying—quite confidently—that under the present rules and regulations governing the sealing interests on these islands the increase or diminution of the seal life thereon will amount to nothing in the future; that the seals will exist, as they do exist, in all time to come at about the same number and condition recorded in this monograph. To test this theory of mine I here, in the record of my surveys of the rookeries, have put stakes down which will answer upon those breeding grounds as a correct guide as to their present as well as to their future condition from year to year.

The theory has been well tested. I was right in then assuming that no increase could be noted over the record of 1872–1874; but I was wrong in then believing that no injury to the regular supply of young male life necessary for the full support of the breeding grounds would follow from the driving and killing of the holluschickie as conducted; also, the deadly work of the pelagic sealer was not suggested in any serious sense sixteen years ago, and I did not take it into calculation. I have given, in my letter of introduction, the reason why this driving of the holluschickie has been so destructive to young male seal life—a reason which I could not grasp in 1872–1874, since it required time and experience to develop the fact beyond argument and contradiction. It is easy to see now in the clear light of the record, that had there been no sealing at sea, and had every young male seal been taken in every drive made from the outset in 1871, over 1 year old and under 5, the annual quota of 100,000 would have been easily filled without injury whatsoever, in less than twenty working days from the 14th of every June, with only one-quarter of the driving necessary under the past and present order of culling out the largest seals for slaughter and

releasing the smaller ones from each drive, when on the killing grounds. In other words, taking all the young male seals as driven, over 1 year old and under 5 years, would have saved on an average for every year, the lives of at least 50,000 to 60,000 holluschickie! while those spared from the club, annually during the last twenty years, were rendered worthless for rookery service from the immediate or subsequent effect of severe overland driving whenever they lived through it.

It is a fact now plainly established that hereafter, should seals ever be driven *for tax and shipment of their skins*, again on these islands, *no culling of the "drives" should be permitted.* The market for the skins will promptly adjust itself to the several ages, sizes, and their value. The rookeries, however, will not, can not, endure any further adjustment of *that fixed scale of size on the killing* grounds. *If it is resumed, then the extermination of the fur seal is right at hand, insofar as its life on the Pribilov Islands is concerned*, even if all pelagic sealing is prohibited![1]

I searched for danger to these interests on every side in 1872–1874. I could detect no disease whatever, even of the most trifling character, in the vast herds: and no legend even, much less statement, of any sickness among the seals was extant.[2]

But the importance of making an accurate record of the areas and position of those great breeding grounds as I found them in 1872–1874 was not lost on me; it impressed me deeply; and these surveys were made then of each rookery. In order that the officers of the Government who came after me, charged with the care and protection of these interests, might understand the feasibility of annually surveying these breeding grounds without disturbing the animals in the least degree, I said then:

During the first week of inspection of some of those earliest arrivals the "seecatchie," which I have described, will frequently take to the water when approached; but these runaways quickly return. By the end of May, however, the same seals will hardly move to the right or left when you attempt to pass through them. Then, two weeks before the females begin to come in and quickly after their arrival, the organization of the fur-seal rookery is rendered entirely indifferent to man's presence on visits of quiet inspection, or to anything else save their own kind, and so continues during the rest of the season.

I have called attention to the singular fact that the breeding seals upon the rookeries and hauling grounds are not affected by the smell of blood or carrion arising from the killing fields or the stench of blubber fires which burn in the native villages. This trait is conclusively illustrated by the attitude of those two rookeries near the village of St. Paul: for, the breeding ground on this spit, at the head of the lagoon, is not more than 40 yards from the great killing grounds to the eastward, being separated from those spots of slaughter and the 70,000 or 80,000 rotting carcasses thereon by a slough not more than ten yards wide. These seals can smell the blood and carcasses upon this field from the time they land in the spring until they leave in the autumn, while the general southerly winds waft to them the odor and sounds of the village of St. Paul, not over 200 rods south of them, and above them in plain sight.

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[1]See suggestions for Revised Regulations. Appendix, p. 228.

[2]The thought of what a deadly epidemic would effect among these vast congregations of *Pinnepedia* was one that was constant in my mind when on the ground and among them. I have found in the British Annals (Fleming's), on page 17, an extract from the notes of Dr. Trail: "In 1833 I inquired for my old acquaintances, the seals of the Hole of Papa Westray, and was informed that about four years before they had totally deserted the island, and had only within the last few months begun to reappear. * * * About fifty years ago multitudes of their carcasses were cast ashore in every bay in the north of Scotland, Orkney, and Shetland, and numbers were found at sea in a sickly state." This note of Trail is the only record which I can find of a fatal epidemic among the seals. It is not reasonable to suppose that the Pribilov rookeries have never suffered from distempers in the past, or are not to in the future, simply because no occasion seems to have arisen during the comparitively brief period of their human domination.

All this has no effect upon the seals; they know that they are not disturbed, and the rookery, the natives declare, has been slightly but steadily increasing. Therefore, with regard to surveying and taking those boundaries assumed by the breeding seals every year at that point of high tide and greatest expansion which they assume between the 8th and 15th of July, it is an entirely practicable and simple task. You can go everywhere on the skirts of the rookeries, almost within reaching distance, and they will greet you with quiet, inoffensive notice, and permit close, unbroken observation when it is subdued and undemonstrative, paying very little attention to your approach.

YEARLY CHANGES IN THE ROOKERIES.

I believe the agents of the Government there are going to notice, every year, little changes here and there in the area and distribution of the rookeries. For instance, one of these breeding grounds will not be quite as large this year as it was last, while another one opposite will be found somewhat larger and expanded over the record which it made last season. In 1874 it was my pleasure and my profit to retraverse all these rookeries of St. George and St. Paul with my field notes of 1872 in my hand, making careful comparisons of their relative size as recorded then and now. To show this peculiarity of enlarging a little here and diminishing a little there, so characteristic of the breeding grounds, I reproduce the following memoranda of 1874:

NORTHEAST POINT, *July 18, 1874.*

Contrast on St. Paul between 1872 and 1874: Quite a strip of ground near Webster's house has been deserted this season, but a small expansion is observed on Hutchinsons Hill. The rest of the ground is as mapped in 1872, with no noteworthy increase in any direction. The condition of the animals and their young excellent. Small irregularities in the massing of the families, due to the heavy rain this morning. Sea lions about the same; none, however, on the west shore of the point.

The aggregate of life on this great rookery is, therefore, about the same as in 1872. The holluschickie, or killable seals, hauling as well and as numerously as before. The proportions of the different ages among them of 2, 3, and 4 year olds pretty well represented.

POLAVINA, *July 18, 1874.*

Stands as it did in 1872. Breeding and hauling grounds in excellent condition; the latter, on Polavina, are changing from the uplands down upon Polavina sand beach, trending for 3 miles toward Northeast Point. The numbers of the holluschickie on this ground of Polavina, where they have not been disturbed for some five years, to mention in the way of taking, do not seem to be any greater than they are on the hauling grounds adjacent to Northeast Point and the village, from which they are driven almost every day during this season of killing. I notice also this remarkable characteristic of the holluschickie: No matter how cleanly the natives may drive the seals off of a given piece of hauling ground this morning, if the weather is favorable to-morrow will see it covered again just as thickly; and thus they drive in this manner from Zoltoi sands almost every day during the killing season, generally finding on the succeeding morning more or as many seals as they drove off the previous dawn. This seems to indicate that the holluschickie recognize no particular point as favored over another at the island when they land, which is evidently in obedience to a general desire of coming ashore at such a suitable place as promises no crowding and no fighting.

LUKANNON AND KEETAVIE, *July 19, 1874.*

Not materially changed in any respect from its condition at this time in 1872.

GARBOTCH, *July 19, 1874.*

Just the same. Condition excellent.

REEF, *July 19, 1874.*

A slight contraction on the south sea margin of this ground compensated for by fresh expansion under the bluffs on the northwest side, not noteworthy in either instance. Condition excellent.

NAH SPEEL, *July 20, 1874.*

A diminution of one-half at least. Very few here this year. It is no place for a rookery. Not a pistol shot from the natives' houses, and all of the natives' children fooling over the bluffs.

LAGOON, *July 20, 1874.*

No noteworthy change; if any, a trifling increase. Condition good. Animals clean and lively.

TOLSTOI, *July 21, 1874.*

No perceptible change in this rookery from its good shape of 1872. The condition excellent.

ZAPADNIE, *July 22, 1874.*

A remarkable extension or increase I note here of 2,000 feet of shore line, with an average depth of 50 feet of breeding ground, which has been built on to Upper Zapadnie, stretching out toward Tolstoi. The upper rookery proper has not altered its bearings or proportions. The sand beach belt between it and Lower Zapadnie is not occupied by breeding seals, and a fair track for the holluschickie, 500 feet wide, left clear, over which they have traveled quite extensively this season. Some 20,000 to 25,000 of them at least lying out around the old salt house to-day. Lower Zapadnie has lost in a noteworthy degree about an average of 20 feet of its general depth, which, however, is more than compensated for by the swarming on the upper rookery. A small beginning had been made for a rookery on the shore just southwest from Zapadnie Lake in 1872, but this year it has been substantially abandoned.

CONTRAST ON ST. GEORGE BETWEEN 1873 AND 1874.

An epitome of my notes for St. George gives, as to this season of 1874, the following data for comparison with that of 1873:

ZAPADNIE, *July 8, 1874.*

This rookery shows a slight increase upon the figures of last year, about 5,000. Fine condition.

STARRY ARTEEL, *July 6, 1874.*

No noteworthy change from last year.

NORTH ROOKERY, *July 6, 1874.*

No essential change from last year. Condition very good.

LITTLE EASTERN, *July 6, 1874.*

A slight diminution of some 2,000 or so. Condition excellent.

EASTERN ROOKERY, *July 7, 1874.*

A small increase over last year of about 3,000; only trifling, however. The aggregate seal life here similar to that of last season, with the certainty of at least a small increase. The unusually early season this year brought the rookery "seecatchie" on the ground very much in advance of the general time; they landed as early as the 10th of April, while the arrival of the cows was as late as usual, corresponding to my observations during the past seasons.

The general condition of the animals of all classes on St. George is most excellent; they are sleek, fat, and free from any disease.

In this way it is plain that, practically, the exact condition of these animals can be noted every season, and should a diminution be observed, due to any cause, known or unknown, the killing can be promptly regulated or stopped to any required quota.

Had such a supervision of these rookeries and hauling grounds been maintained in the manner and method above pointed out, as essential to a correct understanding of their condition, *as it is, then, in 1882 the killing would have been "promptly regulated or stopped," as it should have been:* and the erroneous idea of an increase of seals since my record of 1872–1874, would not have been entertained for a moment, unless dishonestly stimulated.

THE ARRIVAL OF THE BREEDING SEALS (1872–1890).

In view of the changed condition of the rookeries of St. Paul and St. George last summer, I took great care in noting the daily arrival of the breeding seals and methods, contrasting these notes with those taken eighteen years earlier. I can truthfully assert that they come as they came in 1872: in the same time, same manner, and in every respect comport themselves as they did, save in two characteristics—the old bulls are disproportionately scant in number, exceedingly so, and the young male life fit to take their places is virtually extinct. I reviewed in 1874 my studies of this topic in the following language:

I found it an exceedingly difficult matter to satisfy myself as to a fair general average number of cows to each bull on the rookery; but, after protracted study, I think it will be nearly correct when I assign to each male a general ratio of from

15 to 20 females at the stations nearest the water, and for those back in order from that line to the rear,[1] from 5 to 12; but there are so many exceptional cases, so many instances where 45 and 50 females are all under the charge of 1 male; and then again where there are 2 or 3 females only, that this question was and is not entirely satisfactory in its settlement to my mind.

Near Ketavie Point, and just above it to the north, is an old washout of the basalt by the surf, which has chiseled, as it were, from the foundation of the island a lava table with a single roadway or land passage to it. Upon the summit of this footstool, I counted 45 cows, all under the charge of an old veteran. He had them penned up on this table rock by taking his stand at the gate, as it were, through which they passed up and passed down—a Turkish brute typified.

Thus in 1872, when the rookeries were carefully observed with reference to this question, I found *a general average of fifteen cows to each bull* (without taking into consideration the virgin females); in 1890 a *general average of forty to fifty cows to each old bull* (no young ones about) is the result of careful investigation, and single harems, in which *I have counted over one hundred cows*, each in the flimsy charge of an old and weary "sea-catch!" Such harems were not uncommon. This unnatural disproportion of the sexes on these breeding grounds to-day, renders the service there, of reproduction, quite lifeless: almost impotent; wholly so in a large aggregate of cases.

Therefore, with full knowledge of this state of the Pribilov rookeries, I say that their condition will be still worse next year—will be no better for the next four or five years—indeed, it will not, can not, mend until fresh male blood matures and comes upon these fields. These animals must grow up from the pups of last year, and those born this season (the others are either dead, or worthless if alive), and it will take at least seven years for them to do so, and prove their power to check and hold these demoralized and diminished herds from their downward grade of the present hour.

The young male seals on these islands *must have a rest:* a full and earnest opportunity to mature and go unshorn of their virility, upon these dwindling rookeries. If they are not at once spared and substantially undisturbed for at least six or seven years to come, with a prompt suppression of pelagic sealing on the other hand, then it is idle to talk of or plan for the restoration and preservation of the seal life on our islands in Bering Sea.

Then, when it shall be proper and safe to again kill surplus male fur seals for their skins, as a matter of revenue and profit, *an entirely new set of regulations as to the manner of driving and killing must be enforced;*[2] and these regulations must be, will be, quite different from those which have been the law up there during the last twenty-one years. That experience, however, so dearly bought since 1882, now gives us full knowledge of the disease, and understanding for its cure.

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[1] At the rear of all these rookeries there is invariably a large number of able-bodied males which have come late, but wait patiently, yet in vain, for families, most of them having had to fight as desperately for the privilege of being there as any of their more fortunately located neighbors, who are nearer the water, and in succession from there to where they are themselves; but the cows do not like to be in any outside position. They can not be coaxed out where they are not in close company with their female mates and masses. They lie most quietly and contentedly in the largest masses, and cover the surface of the ground so thickly that there is hardly moving or turning room until the females cease to come from the sea. The inaction on the part of the males in the rear, during the breeding season, only serves to qualify them to move into the places which are necessarily vacated by those males that are, in the meantime, obliged to leave from virile exhaustion or incipient wounds. All the surplus able-bodied males that have not been successful in effecting a landing on the rookeries, can not, at any one time during the season, be seen here on this rear line. Only a portion of their number are in sight; the others are either loafing at sea, adjacent, or are hauled out in morose squads between the rookeries on the beaches.

[2] See p. 228 *postea*. Appendix: text of Revised Regulations.

In 1874 I made the following analysis of a detailed description of the seals on the breeding grounds:

REVIEW OF STATEMENTS CONCERNING LIFE IN THE ROOKERIES.

To recapitulate and sum up the system and regular method of life and reproduction on these rookeries of St. Paul and St. George, as the seals seem to have arranged it, I shall say that—

First. The earliest bulls land in a negligent, indolent way, at the opening of the season, soon after the rocks at the water's edge are free from ice, frozen snow, etc. This is, as a rule, about the 1st to the 5th of every May. They land from the beginning to the end of the season in perfect confidence and without fear; they are very fat, and will weigh on an average 500 pounds each. Some stay at the water's edge, some go to the tier back of them again, and so on until the whole rookery is mapped out by them weeks in advance of the arrival of the first female.

Second. That by the 10th or 12th of June all the male stations on the rookeries have been mapped out and fought for, and held in waiting by the "seecatchie." These males are, as a rule, bulls rarely ever under 6 years of age; most of them over that age, being sometimes three, and occasionally doubtless four, times as old.

Third. That the cows make their first appearance, as a class, on or after the 12th or 15th of June in very small numbers; but rapidly after the 23d and 25th of this month every year they begin to flock up in such numbers as to fill the harems very perceptibly, and by the 8th or 10th of July they have all come, as a rule—a few stragglers excepted. The average weight of the female now will not be much more than 80 to 90 pounds each.

Fourth. That the breeding season is at its height from the 10th to the 15th of July every year, and that it subsides entirely at the end of this month and early in August; also, that its method and system are confined entirely to the land, never effected in the sea.

Fifth. That the females bear their first young when they are 3 years old, and that the period of gestation is nearly twelve months, lacking a few days only of that lapse of time.

Sixth. That the females bear a single pup each, and that this is born soon after landing. No exception to this rule has ever been witnessed or recorded.

Seventh. That the "seecatchie" which have held the harems from the beginning to the end of the season leave for the water in a desultory and straggling manner at its close, greatly emaciated, and do not return, if they do at all, until six or seven weeks have elapsed, when the regular, systematic distribution of the families over the rookeries is at an end for this season. A general medley of young males are now free, which come out of the water and wander all over these rookeries, together with many old males which have not been on seraglio duty, and great numbers of females. An immense majority over all others present are pups, since only about 25 per cent of the mother seals are out of the water now at any one time.

Eighth. That the rookeries lose their compactness and definite boundaries of true breeding limit and expansion by the 25th to the 28th of July every year. Then, after this date, the pups begin to haul back to the right and left in small squads at first; but as the season goes on, by the 18th of August, they depart without reference to their mothers, and when thus scattered, the males, females, and young swarm over more than three and four times the area occupied by them when breeding and born on the rookeries. The system of family arrangement and uniform compactness of the breeding classes breaks up at this date.

Ninth. That by the 8th or 10th of August the pups born nearest the water first begin to learn to swim, and that by the 15th or 20th of September they are all familiar, more or less, with the exercise.

Tenth. That by the middle of September the rookeries are entirely broken up. Confused, straggling bands of females are seen among the bachelors, pups, and small squads of old males, crossing and recrossing the ground in an aimless, listless manner. The season now is over.

Eleventh. That many of the seals do not leave these grounds of St. Paul and St. George before the end of December, and some remain even as late as the 12th of January; but that by the end of October and the beginning of November every year all the male seals of mature age—5 and 6 years and upward—have left the islands. The younger males go with the others. Many of the pups still range about the islands, but are not hauled to any great extent on the beaches or the flats. They seem to prefer the rocky shore margin and to lie as high up as they can get on such bluffy rookeries as Tolstoi and the reef. By the end of this month (November) they are, as a rule, all gone.

In precisely the same time and the same manner as above stated in 1872, did the breeding seals arrive and behave on the Pribilov rookeries this season of 1890. I know this by daily verification up to the 11th of

August. *The seals are not "coming later,"*[1] nor are they changed in any respect except as to sadly diminished numbers and the practical extinction of effective male life on the breeding grounds. Illustrative of the extreme regularity of the arrival of these animals every season throughout a period of twenty consecutive years, I present the following statement of the annual dates of first arrivals of fur seals for each year from 1870 to 1890, inclusive. These dates are taken from the Treasury agent's journal on the seal islands.

First appearance of bulls and cows on the rookeries of St. Paul and St. George islands, Pribilov group, Alaska.

Year.	Island of St. Paul.		Island of St. George.	
	Bulls.	Cows.	Bulls.	Cows.
1870	May 2	June 4-6	May 1	.....
1871	May 4	June 4, 5	May 4	.....
1872	May 5	June 6-8	May 6	June 4, 5
1873	Apr. 24	June 6, 7	May 12	June 6, 7
1874	Apr. 23	June 4-6	Apr. 30	June 6-8
1875	Apr. 28	June 4-8	May 5	June 3-8
1876	May 3	June 6-8	Apr. 28	June 4-6
1877	May 17	June 4-6	May 17	Do.
1878	May 6	June 6-8	May 9	Do.
1879	Apr. 29	June 4-6	May 10	Do.
1880	Apr. 30	June 6-8	May 11	June 3-6
1881	May 5	June 2-6	May 6	Do.
1882	Apr. 26	June 4-8	....do ...	June 3-7
1883	May 6	June 5, 6	May 7	June 4-6
1884	Apr. 30	June 4-8	May 3	June 4-8
1885	Apr. 27	June 6-8	Apr. 29	June 4-6
1886	Apr. 16	June 4-6	May 1	June 3-4
1887	May 1	June 3-7	May 7	June 4-6
1888	....do ...	June 4-6	May 8	June 3-6
1889	May 3	....do	May 5	June 4-6
1890	Apr. 28	June 6-8	Apr. 26	Do.

The first drives for food each year on St. Paul Island, have been made with great regularity between the 15th and 21st of May throughout the time specified above; and also on St. George Island. The bulls all arrived prior to and by the 1st of June; the cows all arrived prior to and by the 20th of July of every year.

AS TO THE CAUSE FOR THIS DECREASE ON THE PRIBILOV ROOKERIES.

This point of inquiry does not require elaboration. The reason is plain; the cause fairly asserts itself—*overdriving since 1882, on land, together with the spear, bullet, and buckshot of the pelagic sealer since 1886.* The overdriving has chiefly robbed the rookeries of that supply of fresh male life absolutely required every season and the water pirate has destroyed the females with unborn and born young.[2] It is needless to

[1] This silly cry was dinned into my ears by the white employees of the lessees, incessantly, from the middle of June, 1890, until the end of July, 1890; these men, however, knew better; but that was the way, in their estimation, to hide the truth from ignorant Treasury agents: one man only, of these white agents of the lessees, was manly enough to admit the fallacy of this argument when I faced him with the ruin of the herd. His name is Daniel Webster, a veteran New London, Conn., sealer, who first began his operations on these islands in 1868, and has been here ever since, with a slight intermission, when he passed one sealing season on the Russian seal islands, in Bering Sea. He had, also, prior to this, experience as a "raider" on Robbens Reef, Ochotsk Sea.

[2] Out of 77 fur-seal skins seized on the *Mattie T. Dyer* (schooner), only 6 of them came from animals without pups (i. e., 71 were pregnant females). They (the sealers) had little black pup skins fresh cut out from the womb; womb moist; 17 fresh female fur-seal skins, and every one of these bodies had a pup in them. These men declared that they got only 1 out of every 5 that they shot, that is, for the 5 hit they only got 1 of them. The number of shots fired they did not count; but of the 5 seals that they undertook to get that they hit they usually got but 1 of them.—(United States Collector Emmons, Oonalaska, August 14, 1890.)

speculate as to other causes, for the two cited above are full and ample reasons for the existing diminution. Were they not so patent, we might speculate, as I did in 1872–1874, in the following tone:

THOUGHTS UPON THE POSSIBLE MOVEMENTS OF THE FUR SEALS IN THE FUTURE.

As these animals live and breed upon the Pribilov Islands, the foregoing studies of their habits declare certain natural conditions of landing ground and climate to be necessary for their existence and perpetuation. From my surveys made upon the islands to the north—St. Matthew and St. Lawrence—together with the scientific and corroborating testimony of those who have visited all of the mainland coast of Alaska and the islands contiguous, including the peninsula and the great Aleutian archipelago, I have no hesitation in stating that the fur seal can not breed, or rest for that matter, on any other land than that now resorted to, which lies within our boundary lines; the natural obstacles are insuperable.[1]

Therefore, so far as our possessions extend, we have in the Pribilov group the only eligible land to which the fur seal can repair for breeding: and, on which at St. Paul Island alone, there is still room enough of unoccupied rookery ground for the accommodation of twice as many seals as we find there to-day. But we must not forget a very important prospect, for we know that to the westward only 700 miles, and within the jurisdiction of Russia, are two other seal islands—one very large—on which the fur seal regularly breeds also; and though from the meager testimony in my possession, compared with St. Paul, the fur-seal life upon them is small, still, if that land within the pale of the Czar's dominion be as suitable for the reception of the rookeries as is that of St. Paul, then what guaranty have we that the seal life on Copper and Bering islands at some future time may not be greatly augmented by a corresponding diminution of our own, with no other than natural causes operating? Certainly, if the ground on either Bering or Copper Island, in the Commander group, is as well suited for the wants of the breeding fur seal as is that exhibited by the Pribilof Islands, then I say confidently that we may at any time note a diminution here and find a corresponding augmentation there, for I have clearly shown in my chapter on the habits of these animals that they are not so particularly attached to the respective places of their birth, but that they rather land with an instinctive appreciation of the fitness of that ground as a whole.

NEED OF MORE DEFINITE KNOWLEDGE CONCERNING THE RUSSIAN SEAL ISLANDS.[2]

If we, however, possess all the best-suited ground, then we can count upon retaining the seal life as we now have it by a vast majority; and in no other way: for, it is not unlikely that some season may occur when an immense number of the fur seals which have lived during the last four or five years on the Pribilov Islands should be deflected from their usual feeding range at sea by the shifting of schools of fish and other abnormal causes, which would bring them around quite close to the Asiatic seal grounds in the spring, and the scent from those rookeries would act as a powerful stimulant and attraction for them to land there, where the conditions for their breeding may be just as favorable as they desire. Such being the case, this diminution, therefore, which we would notice on the Pribilov group might be the great increase observed at the Commander Islands, and not due to any mismanagement on the part of the men in charge of these interests. Thus it appears to me necessary that definite knowledge concerning the Commander Islands and the Kuriles should be gathered.

If we find, however, that the character of this Russian seal land is restricted to narrow beach margins under bluffs, as at St. George, then we shall know that a great body of seals will never attempt to land there when they could not do so without suffering and in violation of their laws during the breeding season. Therefore, with this correct understanding to start on, we can then feel alarmed with good reason should we ever observe any diminution to a noteworthy degree on our seal islands of Bering Sea.

POSSIBLE DEFLECTION OF SEALS IN FEEDING.[3]

I do not call attention to this subject with the slightest idea in my mind, as I write, of any such contingency arising even for an indefinite time to come; but still I am sensible of the fact that it is possible for it to occur any season. But, the seals undoubtedly feed on their pelagic fields in systematic routine of travel from the time they leave the Pribilov Islands until that of their return; therefore, in all probability, unless the fish upon which they are nourished, suddenly become scarce in our waters and soundings, our seals will not change their base as matters now progress; yet, it is possible for the finny shoals and schools to be so deflected from their migration to and from their spawning beds as to carry this seal life with it, as I have hinted

[1] In Section VIII of this report will be found the best arrangement of notes bearing upon this subject which I have been able to make.

[2] See p. 211, Appendix. [3] See p. 212, Appendix.

above. Thus it can not be superfluous to call up this question, so that it shall be prominent in discussion and suggestion for future thought.

NEED OF CAREFUL YEARLY EXAMINATION.

In the meantime the movements of the seals upon the great breeding rookeries of St. Paul and those of St. George should be faithfully noted and recorded every year, and as time goes on this record will place the topic of their increase or diminution beyond all theory or cavil.

Since writing and publishing the above I have learned that the Russian seal islands have been steadily increasing their rookery areas from 1870 up to 1879–80; and, since that time, the yield of the hauling grounds over there was trebled in 1889 over the catch of 1876. Whether or not these Slavonian rookeries will stand this driving so as to annually get 62,000 young males hereafter, as was done last year (1889), or fail to do so in a few years to come, I can at this distance only conjecture. But, *our seals have not gone over there; they have been destroyed in plain view on this side!*

The following salient points of change can be clearly stated, in so far as the Pribilov rookeries exist this season of 1890, and contrasted with their condition of 1872:

Status of 1872.	*Status of 1890.*
(1) On the rookery ground the bulls were all by June 1,—and	(1) On the rookery ground the bulls were all by June 1,—and
(2) Located on this ground then no farther than 6 to 10 feet apart.	(2) Located on this ground from 15 to 150 feet apart.
(3) They were very vigorous, very active, incessantly fighting with one another.	(3) They are inert and somnolent. I have not seen a single fight between the bulls yet.
(4) Thousands upon tens of thousands of half bulls, or polseacatchie, which were then trying to land upon the breeding belt of sea margin, provoking and sustaining a constant fight and turmoil, but being almost invariably whipped off by the old bulls.	(4) Not a single half bull, or polseacatchie, attempting to land and serve the cows. Not a single one have I been able to observe. In fact, there are none left. Those that exist now have been ruined as breeders, from the effects of overdriving several thousand of these broken-spirited bulls, old and young, are now loafing on the outskirts of these rookeries and hauling out with the small holluschickie on the sand and rock margins.
(5) Cows began to arrive on the breeding grounds by June 4 to 6, and all arrived in good form by July 10.	(5) Cows began to arrive on the breeding gounds by June 4 to 6. All arrived, as a rule, by July 10.
(6) They were located on the breeding ground in compact solid masses, uniformly distributed over a given area of ground, no matter how large or how small.	(6) They are located on the breeding grounds in scattered harems, solidly here,—there one or two harems, then a dozen or so families scattered over twice and thrice as much ground as they should occupy if massed as in 1872–1874. The scanty supply of, the wide stations and feebleness of the bulls is undoubtedly the reason for this striking change in their distribution as they ordered it in 1872–1874.
(7) A general average of 15 cows to 1 bull was the best understanding. Once in awhile, a peculiar configuration of the breeding ground enabled 1 bull the chance to pen up 35 or 45 cows, but it was seldom witnessed, as a rule.	(7) A general average of 45 or 50 cows to 1 bull is the best estimate that can be made to-day. There are so many harems of 60 and 75 cows in charge of 1 bull to each, and frequently single harems of 100 to 120 cows, that it makes the general average of 45 or 50 very conservative.
(8) Cows all promptly and efficiently served when in heat. Never witnessed a failure.	(8) Many of the cows not served even when persistently solicitous early in the season. Vigorous, willing service seems to be the exception, not the rule. Bulls not one-tenth as numerous as in 1872, and only one-third of the cows here as a rule, and no new young male blood mature and virile enough to take its station on these rookeries.

In regard to the probable number of breeding bulls on each rookery in 1872–1874, I made the following note and tabulation:

ST. GEORGE ISLAND, *North Rookery, July 12, 1873.*

I think now that this is a safe and equitable basis for beginning my calculation. * * * Every 100 feet of sea margin will have 10 bulls on it, and for every 100 feet of depth from the margin we will have a bull for every 7 feet of that depth. * * * They fight so desperately on the sea margin that the average is widest there, uniformly, then it will average up right back, through, 7 by 10 feet, very honestly. * * *

Basis for estimation of bulls in 1872–1874, with an average of 15 cows, 15 pups, and 5 nubile females to each bull.

The reef has 4,016 feet sea margin with 1 bull on every 10 feet of sea margin, 150 feet average depth, and 1 bull for every 7 feet of average depth, which gives 402 bulls by 20½ bulls, or about 8,642 bulls. On this basis and method of calculation, therefore, the rookeries have approximately as follows:

	Bulls.
St. Paul Island:	
Reef	8,642
Garbotch	5,207
Lagoon	580
Lukannon	4,880
Keetavie	4,730
Tolstoi	6,450
Zapadnie, upper wing, 2,814; lower wing, 9,700	12,514
Polavina	8,600
Novashoshnah	34,006
Total bulls for St. Paul	85,609
St. George Island:	
Zapadnie	599
Starry Artel	975
North	2,302
Little Eastern	112
Great Eastern	714
Total bulls for St. George	4,702

Or, in round numbers, a grand total of 90,000 breeding bulls on the rookeries of both islands.

The wide and scanty hauling of the bulls on these breeding grounds for this season of 1890, together with the strange massing of immense harems around single bulls, while the others immediately around have no part in the service, render such a tabulation on the basis of 1872–1874, as above given, quite out of the question as a measure of just contrast. I therefore will not attempt it, since the comparison can not be well made in this respect. [My figures for 1890, give 11,708 bulls for St. Paul; 800 for St. George.]

In concluding my observations under this head, it is, perhaps, not superfluous to anticipate and reply to the following generalizations which will naturally arise to the mind of the general reader.

It seems from the foregoing surveys, that at the close of the season of 1890, there are still existing upon the Pribilov rookeries, 959,000 seals, old and young and pups of this year's birth, or about one-third of the whole number of breeding seals and young recorded as being there in 1872–1874. How, then, can they be so near the danger of extermination, even if they are in danger of it?

The explanation is as follows:

(1) There is but 1 breeding bull now upon the rookery ground, where there were 15 in 1872; and the bulls of to-day are nearly all old, and many positively impotent.

(2) This decrease of virile male life on the breeding grounds causes the normal ratio of 15 or 20 females to a male, as in 1872–1874, now to

reach the unnatural ratio of 50 to even 100 females to an old and enfeebled male.

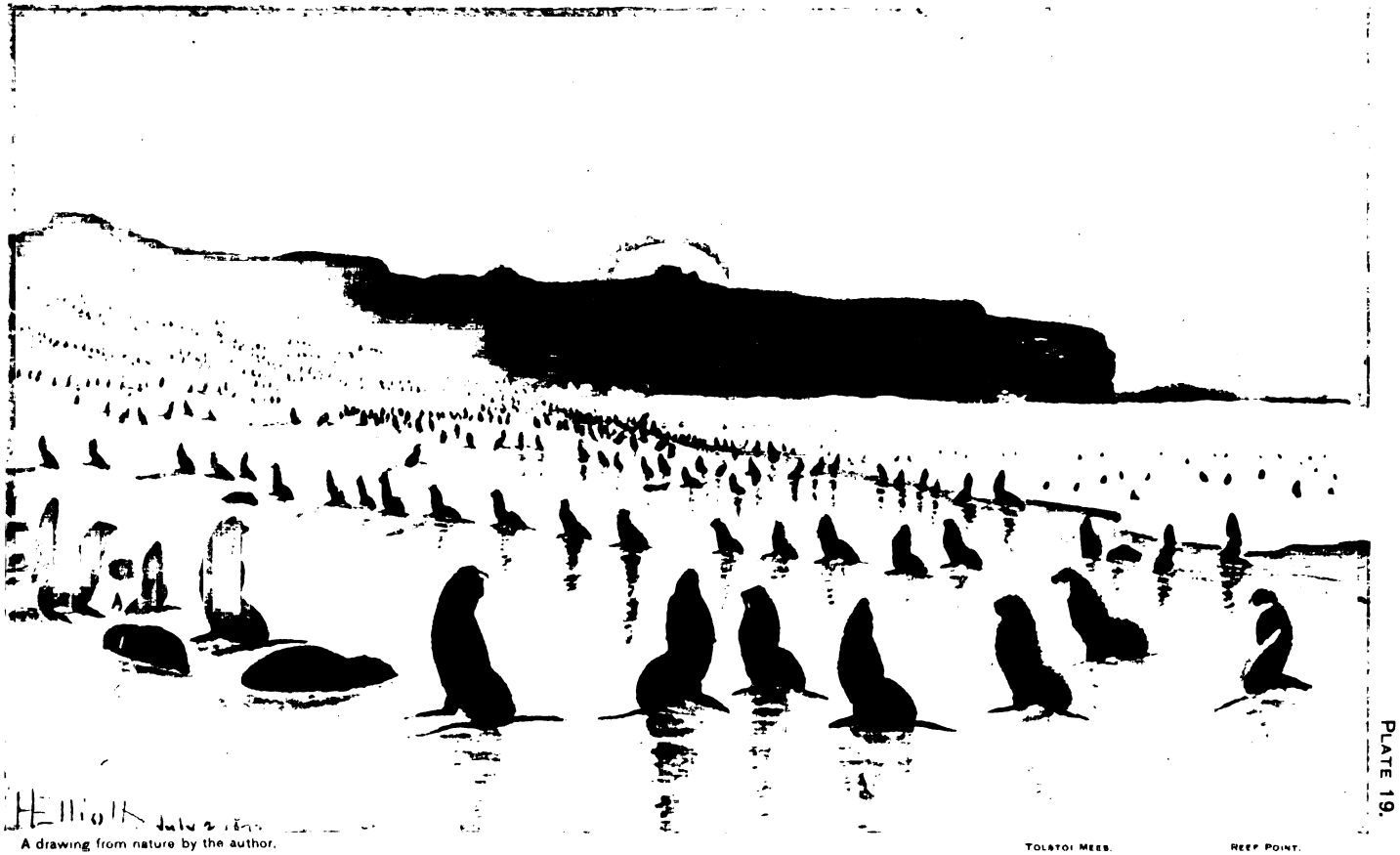
(3) There is no appreciable number of young males left alive to-day on these hauling or nonbreeding grounds, to take their places on the breeding grounds, which are old enough for that purpose: or will be old enough, if not disturbed by man, even if left alone for the next five years.

(4) Meanwhile the natural enemies of the fur seal are just as numerous in the sea and ocean as they ever were. The killer whale and the sharks are feeding upon them, just as they did in 1872–1874.

(5) Therefore, we have destroyed by land and by sea, that equilibrium which nature had established in 1868, on these rookeries, and we must now restore it: or, no other result can follow save that of swift extermination.

(6) That condition of 1872 being restored: then, that surplus male life *must be taken again under better regulations than those of 1870:*[1] and *the pelagic sealing must be restricted to proper limits:* this action will enable the fur markets of the world to have a regular supply for all time to come, provided that it is carried out in good time.

[1] See terms of such regulations, p. 228, Appendix.



A drawing from nature by the author.

TOLSTOI MESS. REEF POINT.

HOLLUSCHICKIE HAULING ON TOLSTOI SANDS, ENGLISH BAY, SAINT PAUL ISLAND.

This is the sight which these seals presented to the observer day and night during the seasons of 1872 1874; not even a suggestion of it was evident in 1880.

PLATE 19.

SECTION II.

THE HAULING GROUNDS OF THE FUR SEAL ON THE PRIBILOV ISLANDS OF ALASKA—THEIR AREA, POSITION, AND CONDITION IN 1872–1874 AND 1890.

THE HAULING GROUNDS OF THE FUR SEAL.

In 1872–1874 these fields of seal life on the Pribilov Islands were in themselves quite as impressive and interesting as the great rookeries then were. To day (1890) it is a difficult matter to say where a single well-defined hauling ground on either island exists of more than slight extent in superficial area—those broad acres of 1874 upon which not even a vestige of vegetable growth could live, owing to the tireless pattering of fur-seal flippers—those clean-swept fields are now mossy, grass-grown, and flecked with indigenous flowering plants clear down to the water's edge, or up to very margins of the rookery grounds, upon which a scanty remnant of that swarming host of surplus male seal life, which so astonished me in 1872, now lands! It hauls there to-day for quiet and protection—instinctively does so, as the last stand for self-preservation left for it on these islands during the past six years.

In 1872 there was a marked distinction between the "rookeries,"[1] or breeding grounds, and the "ezvairie,"[2] or hauling grounds; not in name, not on paper, as it literally is to-day, but in reality then, by the testimony of those grounds and the life thereon itself. I gave the following description of the Pribilov hauling grounds and of that life characteristic of them, in 1874: [*Monograph Seal Islands of Alaska: 1881, p. 43.*]

THE HAULING GROUNDS AND THEIR OCCUPANTS.

I now call the attention of the reader to another very remarkable feature in the economy of the seal life on these islands. The great herds of holluschickie,[3] numbering about one-third, perhaps, of the whole aggregate of near 5,000,000 seals known to the Pribilov group, are never allowed by the "see-catchie," under the pain of frightful mutilation or death, to put their flippers on or near the rookeries.

By reference to my map it will be observed that I have located a large extent of ground, markedly so on St. Paul, as that occupied as the seals' hauling grounds. This area, in fact, represents those portions of the island upon which the holluschickie roam in their heavy squadrons, wearing off and polishing the surface of the soil, stripping every foot, which is indicated on the chart as such, of its vegetation and mosses, leaving the margin as sharply defined on the bluffy uplands and sandy flats as it is on the map itself.

The reason that so much more land is covered by the holluschickie than by the breeding seals—ten times as much, at least—is due to the fact that though not as numerous, perhaps, as the breeding seals, they are tied down to nothing, so to speak, are wholly irresponsible, and roam hither and thither as caprice and the weather may dictate. Thus they wear off and rub down a much larger area than the rookery

[1] "Rookery," an old sealer's term, derived from the swarming, noisy roosts of the rook-bird in England.

[2] "Ezvairie," a Russian equivalent of "*hauling up;*" means literally a "*coming out*" or "*coming up.*" The natives call the rookeries "*laying out*" places or "laasbustchie," and the hauling grounds, "ezvairie."

[3] The Russian term "holluschickie" or "bachelors" is very appropriate, and is usually employed.

seals occupy. Wandering aimlessly and going back, in some instances, notably at English Bay, from one-half to a whole mile inland, not traveling in desultory files along winding, straggling paths, but sweeping in solid platoons, they obliterate every spear of grass and rub down nearly every hummock in their way.

DEFINITION OF "HOLLUSCHICKIE."

All the male seals, above 6 years of age, and under, are compelled to herd apart by themselves and away from the breeding grounds, in many cases far away, the large hauling grounds at Southwest Point being about 2 miles from the nearest rookery. This class of seals is termed "holluschickie" or the "bachelor" seals by the people, a most fitting and expressive appellation.

The seals of this great subdivision are those with which the natives on the Pribilov group are the most familiar; naturally and especially so, since they are the only ones, with the exception of a few thousand pups and occasionally an old bull or two taken late in the fall for food and skins, which are driven up to the killing grounds at the village for slaughter. The reasons for this exclusive attention to the bachelors are most cogent, and will be given hereafter when the business is discussed.

LOCATING THE HAULING GROUNDS.—PATHS THROUGH THE ROOKERIES.

Since the holluschickie are not permitted by their own kind to land on the rookeries and stop there, they have the choice of two methods of locating, one of which allows them to rest in the rear of the rookeries and the other on the free beaches. The most notable illustration of the former can be witnessed on Reef Point, where a pathway is left for their ingress and egress through a rookery—a path left by common consent, as it were, between the harems. On these trails of passage they come and go in steady files all day and all night during the season, unmolested by the jealous bulls which guard the seraglios on either side as they travel. All peace and comfort to the young seal if he minds his business and keeps straight on up or down, without stopping to nose about right or left; all woe and desolation to him, however, if he does not, for in that event he will be literally torn in bloody griping, from limb to limb, by the vigilant old "see-catchie."

Since the two and three year old holluschickie come up in small squads with the first bulls in the spring, or a few days later, such common highways as those between the rookery ground and the sea are traveled over before the arrival of the cows and get well defined. A passage for the bachelors, which I took much pleasure in observing day after day at Polavina, another at Tolstoi, and two on the reef, in 1872, were entirely closed up by the "see-catchie" and obliterated when I again searched for them in 1874. Similar passages existed, however, on several of the large rookeries of St. Paul. One of those at Tolstoi exhibits this feature very finely, for here the hauling ground extends around from English Bay, and lies up back of the Tolstoi rookery, over a flat and rolling summit, from 100 to 120 feet above the sea level. The young males and yearlings of both sexes come through and between the harems at the height of the breeding season on two of these narrow pathways, and before reaching the ground above are obliged to climb up an almost abrupt bluff, which they do by following and struggling in the water runs and washes that are worn into its face. As this is a large hauling ground on which, every favorable day during the season, 15,000 or 20,000 commonly rest, the sight of skillful seal climbing can be witnessed here at any time during that period, and the sight of such climbing as this of Tolstoi is exceedingly novel and interesting. Why, verily, they ascend over and upon places where an ordinary man might, at first sight, with great positiveness say that it was utterly impossible for him to climb.

HAULING GROUNDS ON THE BEACHES.

The other method of coming ashore, however, is the one most followed and favored. In this case they avoid the rookeries altogether and repair to the unoccupied beaches between them, and then extend themselves out all the way back from the sea, as far from the water in some cases as a quarter and even half of a mile. I stood on the Tolstoi sand dunes one afternoon, toward the middle of July, having under my eyes, in a straightforward sweep over from my feet to Zapadnie, 1,500,000 seals spread out on those hauling grounds. Of these I estimated that fully one-half at that time were pups, yearlings, and holluschickie. The rookeries across the bay, though plainly in sight, were so crowded that they looked exactly as I have seen surfaces appear upon which bees had swarmed in obedience to that din and racket made by the watchful apiarian when he desires to hive the restless honey makers.

The great majority of yearlings and holluschickie are annually hauled out and packed thickly over the sand beach and upland hauling grounds which lay between

the rookeries on St. Paul Island. At St. George there is nothing of this extensive display to be seen, for here is only a tithe of the seal life occupying St. Paul, and no opportunity whatever is afforded for an amphibious parade.

GENTLENESS OF THE SEALS.

Descend with me from this sand-dune elevation of Tolstoi, and walk into that drove of holluschickie below us. We can do it. You do not notice much confusion or dismay as we go in among them; they simply open out before us and close in behind our tracks, stirring, crowding to the right and left as we go, 12 or 20 feet away from us on each side. Look at this small flock of yearlings, some 1, others 2, and even 3 years old, which are coughing and spitting around us now, staring up at our faces in amazement as we walk ahead. They struggle a few rods out of our reach and then come together again behind us, showing no further sign of notice of ourselves. You could not walk into a drove of hogs at Chicago without exciting as much confusion and arousing an infinitely more disagreeable tumult; and as for sheep on the plains, they would stampede far quicker. Wild animals indeed! You can now readily understand how easy it is for two or three men—early in the morning—to come where we are, turn aside from this vast herd in front of and around us 2,000 or 3,000 of the best examples, and drive them back, up, and over to the village. That is the way they get the seals. There is not any "hunting" or "chasing" or "capturing" of fur seals on these islands.

HOLLUSCHICKIE DO NOT FAST.

While the young male seals undoubtedly have the power of going for lengthy intervals without food, they, like the female seals on the breeding grounds, certainly do not maintain any long fasting periods on land. Their coming and going from the shore is frequent and irregular, largely influenced by the exact condition of the weather from day to day. For instance, three or four thick, foggy days seem to call them out from the water by hundreds of thousands upon the different hauling grounds which the reader observes recorded on my map. In some cases I have seen them lie there so close together that scarcely a foot of ground over whole acres was bare enough to be seen. Then, a clear and warmer day follows, and this seal-covered ground, before so thickly packed with animal life, will soon be almost deserted: comparatively so at least, to be filled up immediately again when favorable weather shall reappear. They must frequently eat when here, because the first yearlings and holluschickie that come in the spring, are no fatter, sleeker, or livelier than they are at the close of the season; in other words, their condition, physically, seems to be the same from the beginning to the end of their appearance here during the summer and fall. It is quite different, however, with the "see-catchie." We know how and where it spends two to three months, because we find it on the grounds at all times, day or night, during that period.

SPORTS AND PASTIMES OF THE YOUNG BACHELORS.

A small flock of the young seals, one to three years old generally, will often stray from these hauling-ground margins, up and beyond, over on to the fresh mosses and grasses, and there sport and play one with another just as little puppy dogs do: and when weary of this gamboling, a general disposition to sleep is suddenly manifested, and they stretch themselves out and curl up in all the positions and all the postures that their flexible spines and ball-and-socket joints will permit. They seem to revel in the unwonted vegetation, and to be delighted with their own efforts in rolling down and crushing the tall stalks of the grasses and umbelliferous plants. One will lie upon its back, hold up its hind flippers and lazily wave them about, while it scratches or rather rubs its ribs with the fore hands alternately, the eyes being tightly closed during the whole performance. The sensation is evidently so luxurious that it does not wish to have any side issue draw off its blissful self-attention. Another, curled up like a cat on a rug, draws its breath, as indicated by the heaving of its flanks, quickly but regularly as though in heavy sleep. Another will lie flat upon its stomach, its hind flippers covered and concealed, while it tightly folds its fore feet back against its sides just as a fish carries its pectoral fins. And so on to no end of variety according to the ground and the fancy of the animals.

These bachelor seals are, I am sure, without exception the most restless animals in the whole brute creation which can boast of a high organization. They frolic and lope about over the grounds for hours without a moment's cessation, and their sleep after this is exceedingly short: it is usually accompanied with nervous twitchings and uneasy muscular movements. They seem to be fairly brimful and overrunning with spontaneity, to be surcharged with fervid, electric life.

Another marked feature which I have observed among the multitudes of holluschickie that have come under my personal observation and auditory, and one very

characteristic of this class, is that nothing like ill-humor appears in all of their playing together; they never growl, or bite, or show even the slightest angry feeling, but are invariably as happy, one with another, as can be imagined. This is a very singular trait; they lose it, however, with astonishing rapidity, when their ambition and strength develops and carries them, in due course of time, to the rookery.

The pups and yearlings have an especial fondness for sporting on the rocks which are just at the water's level and awash, so as to be covered and uncovered as the surf rolls in. On the bare summit of these wave-worn spots they will struggle and clamber in groups of a dozen or two at a time throughout the whole day, in endeavoring to push off that one of their number which has just been fortunate enough to secure a landing. The successor has, however, but a brief moment of exultation in victory, for the next roller that comes booming in, together with the pressure by its friends, turns the table, and the game is repeated, with another seal on top. Sometimes, as well as I could see, the same squad of holluschickie played for a whole day and night, without a moment's cessation, around such a rock as this off Nah Speel rookery; but in this observation I may be mistaken, because the seals can not be told apart.

SEALS AMONG THE BREAKERS.

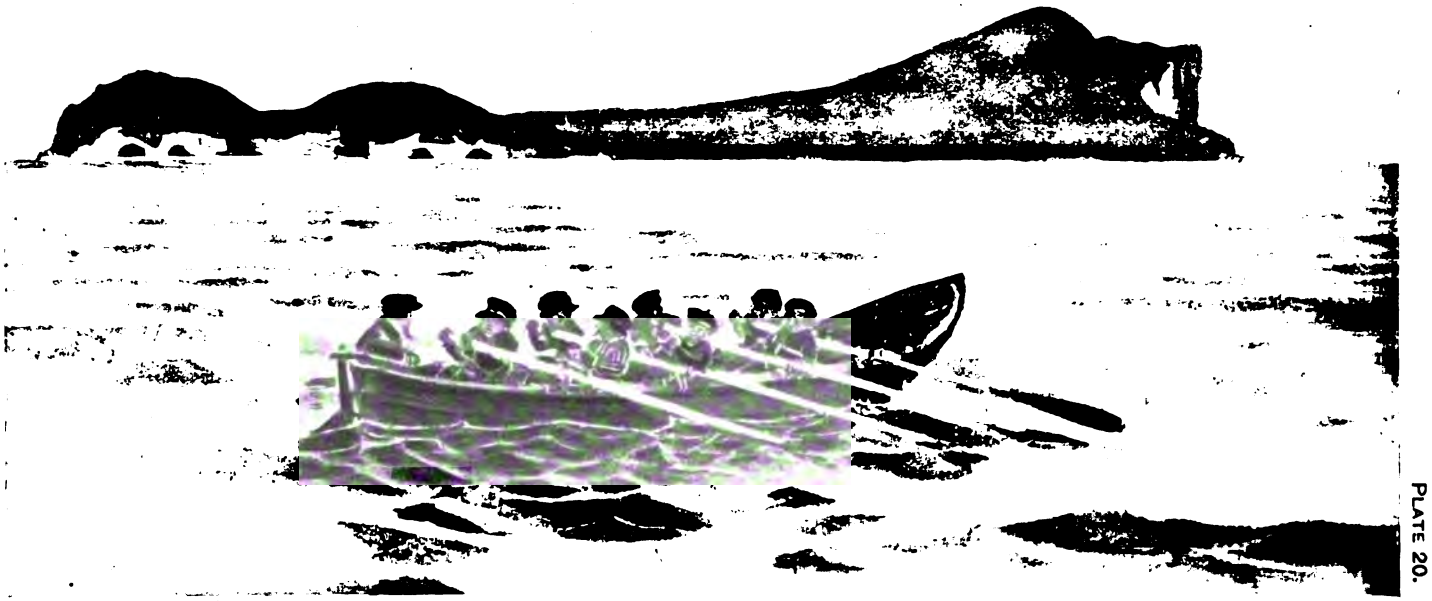
The graceful unconcern with which the fur seal sports safely in, among, and under booming breakers during the prevalence of the numerous heavy gales at the islands has afforded me many consecutive hours of spell-bound attention to them: absorbed in watching their adroit evolutions within the foaming surf that seemingly every moment, would in its fierce convulsions, dash these hardy swimmers, stunned and lifeless, against the iron-bound foundations of the shore which alone checked the furious rush of the waves. Not at all. Through the wildest and most ungovernable mood of the roaring tempest and storm-tossed waters attending its transit I never failed, on creeping out and peering over the bluffs in such weather, to see squads of these perfect watermen, the most expert of all amphibians, gamboling in the seething, creamy wake of mighty rollers which constantly broke in thundertones over their alert, dodging heads. The swift succeeding seas seemed every instant to poise the seals at the very verge of death. Yet the *Callorhinus*, exulting in his skill and strength, bade defiance to their wrath and continued his diversions!

SWIMMING FEATS OF THE BACHELORS.

The holluschuckie are the champion swimmers of all the seal tribe; at least, when in the water around the islands they do nearly every fancy tumble and turn that can be executed. The grave old males and their matronly companions seldom indulge in any extravagant display as do these youngsters, jumping out of the water like so many dolphins describing beautiful elliptic curves, sheer above its surface, rising 3 and even 4 feet from the sea, with the back slightly arched, the fore flippers folded tightly against the sides and the hinder ones extended and pressed together straight out behind, plumping in head first: to reappear in the same manner, after an interval of a few seconds of submarine swimming, like the flight of a bird on their course. Sea lions and hair seals never jump in this manner.

All classes will invariably make these dolphin jumps when they are surprised or are driven into the water, curiously turning their heads while sailing in the air, between the "rises" and "plumps," to take a look at the cause of their disturbance. They all swim rapidly, with the exception of the pups, and may be said to dart under the water with the velocity of a bird on the wing. As they swim, they are invariably submerged, running along horizontally about 2 or 3 feet below the surface, guiding their course with the hind flippers as by an oar, and propelling themselves solely by the fore feet: rising to breathe at intervals, which are either very frequent, or else, so wide apart, that it is impossible to see the speeding animal when he rises a second time.

How long they can remain under water without taking a fresh breath is a problem which I had not the heart to solve by instituting a series of experiments at the island; but I am inclined to think that if the truth were known in regard to their ability of going without rising to breathe it would be considered astounding. On this point, however, I have no data worth discussing: but will say that in all their swimming which I have had a chance to study, as they passed under the water, mirrored to my eyes from the bluff above by the whitish-colored rocks below the rookery waters at Great Eastern rookery, I have not been able to satisfy myself how they used their long, flexible hind feet other than as steering media. If these posterior members have any perceptible motion it is so rapid that my eye is not quick enough to catch it; but the fore flippers, however, can be most distinctly seen as they work in feathering forward and sweeping flatly back, opposed to the water, with great rapidity and energy. They are evidently the sole propulsive power of the fur seal in the



A drawing from nature by the author.

CRATER POINT. LANDING WEST END BLUFFS.

VIEW OF THE NORTH SHORE OF OTTER ISLAND, PRIBILOV GROUP, JULY 5, 1890.

Natives crossing over from Saint Paul in the "baidar."

PLATE 20.

water, as they are its main fulcrum and lever combined for progression on land. I regret that the shy nature of the hair seal never allowed me to study its swimming motions: but, it seems to be a general point of agreement among authorities on the *Phocidæ*, that all motion in water by them arises from that power which they exert and apply with the hind feet. So far as my observations on the hair seal go, I am inclined to agree with this opinion.

All their movements in water, whether they are traveling to some objective point or are in sport, are quick and joyous; and nothing is more suggestive of intense satisfaction and pure physical comfort than is that spectacle which we can see every August, a short distance out at sea from any rookery, where thousands of old males and females are idly rolling over in the billows side by side, rubbing and scratching with their fore and hind flippers which are here and there stuck up out of the water by their owners like the lateen sails of the Mediterranean feluccas: or, when the hind flippers are presented, like a "cat o' nine tails." They sleep in the water a great deal more than is generally supposed, showing that they do not come on land to rest—very clearly not.

The foregoing description of the hauling grounds and their occupants, or the killable seals, as they existed in 1872–1874 on the seal islands of Alaska, was very soberly drawn from the bright view which they then presented; but, moderate as the simple truth of it is, it reads like a romance when contrasted with the condition of these fields and life as it is to-day!

While the diminution of the area and the life on the breeding grounds of St. Paul is such as to show a trifle more than one-third of its extent and volume to-day compared with what existed in 1872, yet the discrepancy between the area of the hauling grounds on this island and number of occupants as presented in 1872 and again in 1890, is something positively startling—is almost unreal—but the truth easily asserts its strange reality on the accompanying map of these hauling grounds of St. Paul Island. The tint of 1872 seems an almost fabulous expanse when contrasted with the microscopic shade of 1890.

The loss is much greater here than on the rookeries, for the following reasons:

Ever since 1879–1882 the surplus young male seal life has been sensibly feeling the pressure of the overland death drive, and the club. Harder and harder became this wretched driving to get the culled quota in 1883–84. Finally, when 1886 arrived, every nook and cranny on these islands that had hitherto been visited by these seals in peace, was now daily searched out—close up, back of, and against the breeding rookeries, under every cliff wall by the sea, over to Southwest Point and to Otter Island, and even the little islet, Seevitchie Kammin, under the lee of the Reef, was regularly hunted out.

Every 3-year old, every 4-year old, and every well-grown 2-year old male seal has been annually taken here, during the last two years, within a day or two at the latest, after it showed up on the beaches and in the rear of the rookeries, prior to the 26th to 31st of July!

In 1872, the killable seals were permitted to "haul up" in every sense of the word. They hauled out far inland from the sea. In 1890, the few killable seals that appeared never had time in which to "haul up" over the land. They simply landed: then, at the moment of landing, were marked and hustled into a drive. Up to the 20th of July, last summer, from the day of their first general hauling as a body in June, this class of seals never had an opportunity to get wonted or accustomed to the land—never were permitted to rest long enough to do so after landing.

ORDER AND TIME OF THE HAULING OF THE HOLLUSCHICKIE.

A careful comparison day by day of the arrival of the killable seals last season (1890), with my field notes of 1872–1874, declares that the holluschickie are hauling to-day in the same time and order of arrival,

from the beginning of the season in May until its close, by the end of July; but their vastly reduced numbers and the rigorous driving to which this remnant is subjected have caused them to abandon the hauling grounds of 1872–1874 entirely, with the solitary exception of that sand beach under Middle Hill, English Bay, of St. Paul. They now haul close into the rear of the breeding seals on the several rookery grounds of both islands; hauling there, as I have said before, for shelter and protection.

When the old bulls first appear for the season at the rookery grounds early in May of every year, as a rule only a few squads of holluschickie accompany them. While these early bulls land promptly by the 4th to the 6th of that month, and all of them arrive and land by the close of it, yet the holluschickie do not come ashore until the 15th or 20th of May, as a rule; sometimes a few days earlier and sometimes a few days later. Only a few hundred of these young males land at any one place or time as early as the 15th of May.

But, after this date, rapidly after the 25th to the 31st of May, the holluschickie of the largest growth, i. e., the 5, 4, 3, and many 2 year old males, begin to haul. By the 14th to the 20th of June they then appear in their finest form and number for the season, being joined now by the half bulls, the 2 and 3-year olds and quite a number of yearling males. By the 10th of July their numbers are beginning to largely increase, owing to the influx at this time of that great body of the last year's pups or yearlings. By the 20th of July the yearlings have put in their appearance for the season in full force. Very few yearling females make their appearance until the 15th of July, but by the 20th they literally swarmed out, in 1872–1874, and mixed up completely with the young and older males and females, as the rookeries relax their discipline and "pod" or scatter out.

By the 20th of July annually, therefore, the seals of all ages have arrived that are to arrive. It was so in 1872; it was so last season, 1890.

If it were true, as the idea of some sealers would have it, that the young male seals all haul on the ground contiguous to the rookery where they were born, it would be very puzzling to account for several marked exceptions to that rule; but it is not true. Young male seals born upon St. Paul Island have been repeatedly marked as they left for the season, and these marked pups have been taken up in St. George drives as yearlings, 2-year olds, and even 4-year olds, during the following season or seasons. This experiment was repeatedly made by the Russians,[1] and has been made once by us.

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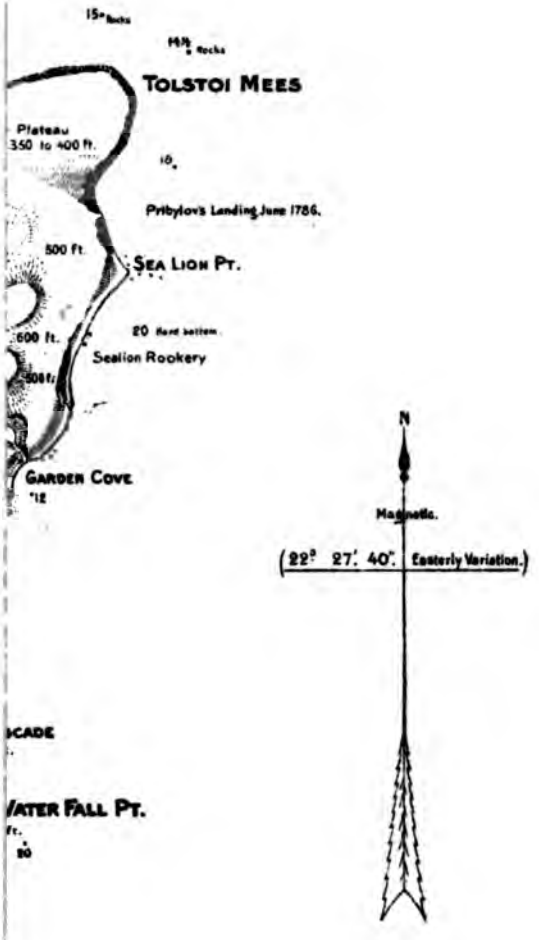
[1]It is entertaining to note in this connection that the Russians themselves, with the object of testing this mooted query, during the later years of their possession of the islands drove up a number of young males from Lukannon, cut off their ears, and turned them out to sea again. The following season, when the droves came in from the hauling grounds to the slaughtering fields, quite a number of those cropped seals were in the drives: but, instead of being found all at one place—the place from whence they were driven the year before—they were scattered examples of croppies from every point on the island. The same experiment was again made by our people in 1870 (the natives having told them of this prior undertaking) and they went also to Lukannon, drove up 100 young males, cut off their left ears, and set them free in turn. Of this number, during the summer of 1872, when I was there, the natives found in their driving of 75,000 seals from the different hauling grounds of St. Paul up to the village killing grounds, two on Novastoshnah rookery, 10 miles north of Lukannon, and two or three from English Bay and Tolstoi rookeries, 6 miles west by water; one or two were taken on St. George Island, 36 miles to the southeast, and not one from Lukannon was found among those that were driven from there. Probably had all the young males on the two islands this season been examined, the rest



ORGE ISLAND; Pribylov Group.

d Position of the Fur Seal Breeding and Hauling
une, July, 1873—74, and August 1890, and drawn
HENRY W. ELLIOTT.

1. 2. 3. 4.

SCALE: STATUTE MILES.

H.Doc. 175, 54 1.

CONDITION OF THE HAULING GROUNDS, ST. PAUL ISLAND, PRIBILOV GROUP.

[From my field notes made in 1872–1874, and published in 1874, and again in 1881.]

Status of 1872–1874.

ZOLTOI.

JUNE 19, 1872 (pp. 50, 51).

These Zoltoi sands are, however, a famous rendezvous for the holluschickie, and from them during the season the natives make regular drives, having only to step out from their houses in the morning and walk back a few rods to find their fur-bearing quarry.

JUNE 20, 1872 (p. 71).

* * * If the weather was favorable for landing, i. e., cool, moist, and foggy, the fresh hauling of the holluschickie would cover the bare grounds again in a very short space of time. Sometimes, in a few hours after the driving of every seal from Zoltoi sands over to the killing fields adjacent those dunes and the beach in question would be swarming anew with fresh arrivals.

JULY 20, 1874 (p. 72).

As matters are to-day 100,000 seals alone can be taken and skinned in less than forty working days within a radius of 1½ miles from the village, * * * hence the driving, with the exception of two experimental droves, * * * has never been made from longer distances than Tolstoi to the westward, Lukannon to the northward, and Zoltoi to the southward of the killing grounds at St. Paul village.

TOLSTOI.

(Page 53.)

Directly to the west from Lukannon, up along and around the head of the lagoon, is the seal path road over which the natives bring the holluschickie from Tolstoi.

JULY 20, 1874 (p. 72).

As matters are to-day 100,000 seals on St. Paul alone can be taken and skinned in less than forty working days within a radius of 1½ miles from the village and from the salt house of Northeast Point; hence the driving, with the exception of two experimental droves, which I witnessed in 1872, has never been made from longer distances than Tolstoi to the westward, Lukannon to the northward, and Zoltoi to the southward of the killing grounds at St. Paul village.

[From my field notes as per date, made last summer.]

Status of 1890.

ZOLTOI.

MAY 22, 1890.

The sand has drifted very slightly from its boundaries during the last eighteen years.

JUNE 19, 1890.

Not a single holluschickie of any age whatever on Zoltoi this day, and there has not been a killable seal there thus far this season.

JUNE 22, 1890.

Fine weather for seals to haul continues, but the seals do not haul; not a single seal on Zoltoi sands this morning. Has not been a holluschickie there yet, and this was the never-failing resort of the natives in 1872–1876. Therefore, this vacancy on Zoltoi makes a deep impression on one who has stood there in 1872–1874 and observed the swarming platoons of hauling holluschickie, now entirely vanished.

JULY 19, 1890.

Not a single holluschickie on Zoltoi sands this morning, *and not one has hauled there, thus far, this season.*

TOLSTOI.

JUNE 15, 1890.

During the last ten days, while inspecting the several breeding grounds of this island, I have paid careful attention to every squad of holluschickie that has appeared, and except as to numbers I do not observe any change up to date in their habit of hauling early in the season. These early squads appear just above the surf margin at Tolstoi in English Bay * * * precisely as they did in 1872, only the number is smaller.

JUNE 19, 1890.

* * * I had a full sweep of English Bay; a small squad of perhaps 150 holluschickie at Middle Hill and another small pod at the intersection of the sand beach with Tolstoi rookery.

JUNE 22, 1890.

* * * At this time in 1872–1874, inclusive, I never glanced over at Zoltoi but I saw holluschickie coming and going from and to the sea in steady files and platoons. I never looked over the broad sweep of English Bay beach from the high sand dunes of Tolstoi but to see the same sight, only in vastly greater form

by

HENRY W. ELLIOTT.

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LUKANNON.

JUNE 20, 1872.

The sand dunes to the west and to the north are covered with the most luxuriant grass, abruptly emarginated by the sharp abrasion of the hauling seals. This is shown very clearly on the general map. * * * This is the point down along the flat shoals of Lukannon Bay where the sand dunes are most characteristic, as they rise in their wind-whirled forms just above the surf wash. This, also, is where the natives come from the village during the early mornings of the season for driving to get any number of holluschickie.

JULY 12, 1872.

The task of getting up early in the morning and going out to the several hauling grounds closely adjacent is really all there is of the labor involved in securing the number of seals required for the day's work on the killing grounds. The two, three, or four natives upon whom, in rotation, this duty is devolved by the order of their chief, rise at first glimpse of dawn, between 1 and 2 o'clock, and hasten over to Lukannon, Tolstoi, or Zoltoi, as the case may be: "walk out" their holluschickie, and have them duly on the slaughtering field before 6 or 7 o'clock, as a rule, in the morning. In favorable weather the "drive" from Tolstoi consumes two and a-half to three hours' time; from Lukannon, about two hours, and is often done in an hour and a-half, while Zoltoi is so near by that the time is merely nominal.

JULY 20, 1872.

As matters are to-day 100,000 seals on St. Paul alone can be taken and skinned within a radius of 1½ miles from the village; * * * hence the driving * * * has never been made from longer distances than Tolstoi to the westward, Lukannon to the northward, and Zoltoi to the southward of the killing grounds at St. Paul village.

and numbers. * * * I do not see to-day, except at Middle Hill, the least suggestion of the past. Will it improve?

JULY 12, 1890.

* * * When it is borne in mind that in the very height of the season, after five days' rest, or nonattention, only 633 medium fur-seal skins, mostly 5½ pounds clean skins, or 2-year olds, can be secured from the combined scraping of everything in English Bay (on Zapadnie we know there is nothing), Middle Hill, Tolstoi, Lukannon, and Ketavie, the extraordinary condition of these interests can be well understood in a general way. Such a driving in 1872, at this time and circumstance of weather, would have brought 100,000 holluschickie up here, instead of the 5,150 to-day. Three cows in this drive.

LUKANNON.

JUNE 19, 1890.

I ascended the basaltic ridge, between Lukannon sands and the village, late this morning, between 8 and 9 o'clock. Not a single seal, old or young, on these hauling grounds and sands of Lukannon.

JUNE 21, 1890.

From the Volcanic Ridge I had a clear view of Lukannon beach and hauling grounds. Not a seal upon it of any age, and the weather superb for seals to haul in; cool, moist, and foggy.

JUNE 24, 1890.

* * * In the afternoon I took a survey of Lukannon Bay and hauling grounds. Not a seal on the beach except a half-dozen half bulls abreast of the Volcanic Ridge. * * *

JULY 1, 1890.

Not a seal on the hauling ridge and sands of Lukannon Bay, and none on Ketavie.

JULY 8, 1890.

I came down on the sand beach between Tonkie Mees and Lukannon. Not a seal has hauled there yet, this year, a place where thousands upon tens of thousands were to be seen at this time in 1872!

JULY 13, 1890.

Along the entire spread of Lukannon, Polavina, and Northeast Point sand beach, 8 miles, nearly, I did not see a single young seal; only a dozen or two old, worthless bulls scattered here and there at wide intervals. Over this extent and at this time in 1872 such a walk as mine this morning would have brought me in contact with and in sight of 50,000 to 100,000 holluschickie! and the weather simply superb hauling weather all day yesterday, last night, and this morning.

ZAPADNIE.

JULY 14, 1874.

The holluschickie that sport here on the parade plateau, and indeed over all the western extent of the English Bay hauling grounds, have never been visited by the natives for the purpose of selecting killing drives since 1872, inasmuch as more seals than were wanted have always been procured from Zoltoi, Lukannon, and Lower Tolstoi points, which are all very close to the village.

JULY 4, 1872.

I stood on the Tolstoi sand dunes one afternoon, toward the middle of July, and had under my eyes in one straight forward sweep from my feet to Zapadnie 1,500,000 seals spread out on those hauling (and breeding) grounds. Of those, I estimated fully one-half at that time were pups, yearlings, and holluschickie. The rookeries across the bay were plainly in sight and so crowded that they looked exactly as I have seen surfaces appear upon which bees had swarmed in obedience to that din and racket made by the watchful apiarian when he desires to hive those restless honey makers.

JULY 22, 1874.

* * * and a fair track for the holluschickie, 500 feet wide, left clear, over which they have traveled quite extensively this season, some 20,000 to 25,000 of them, at least, lying out around the old salt house to-day.

ZAPADNIE.

JULY 3, 1890.

These drives at Zapadnie are made just as they are made at all the other rookeries this season—just swept up from the immediate skirts of the breeding seals, cows, pups, and bulls. This method of driving was not even suggested at any time in 1872–1874. Such a proceeding would have been voted abominable then; it is still more so now. It sweeps every young male seal that is 4, 3, and 2 years old into death as soon as it hauls to-day. Nothing escapes except that which old age or extreme youth saves—or, in other words, the high tax of $10.22 saves.

JULY 9, 1890.

I went over to Zapadnie early this morning with the natives and witnessed their driving. Most of the scanty drive was taken from the borders of Upper Zapadnie rookery. The whole sweep of Lower Zapadnie did not yield over 200 holluschickie, which had hauled in at several places just upward above the breeding seals. All that large space up above the rookery on Lower Zapadnie which was literally alive with trooping platoons of holluschickie in 1872 is to-day entirely vacant! not a seal on it, and the natives peering over the high bluffs on the south side of and to the westward of the point trying to find a few seals skulking down there on the rocks awash. Their eager search, with their backs turned to this silent parade ground of 1872, made me decidedly thoughtful.

JULY 18, 1890.

This last scrape made here to-day was opened by the appearance of only 1,192 animals on the grounds after a rest of nine days since the last drive from this place; 115 of these 1,192, were old bulls, all over 6 years, and the balance outside of the catch (241) are yearlings, "runty" 2-year-olds, "bitten" 4-year-olds, and a few 5-year-old "wigs." Every 4-year-old "wig" was taken—taken here, as at Polavina yesterday, for the first time this season—every "smooth" 4-year-old was taken in the first drives, and now the dregs are drawn also.

POLAVINA.

JULY 20, 1874.

* * * Surmounting this lava bed is a cap of ferrugineous cement and tufa, from 3 to 10 feet in thickness, making a reddish floor upon which the seals patter in their restless, never-ceasing evolutions, sleeping or waking on the land. It is as great a single-parade plateau of polished cement as that of the reef, but we are unable from any point of observation to appreciate it, inasmuch as we can not stand high enough to overlook it. * * * The rookery itself occupies only a small

POLAVINA.

JUNE 16, 1890.

I came along on foot to the village, giving Polavina a survey down outside so as to see the old and new seal grass on that famous parade. It is somewhat too soon to arrive at a conclusion, but what I saw and noted causes surprise. Suppose you had, fourteen or sixteen years ago, been upon an eminence overlooking a sheep pasture or fold some three-fourths of a mile in length and 1,500 to 2,000 feet in width, so filled with a herd or flock of sheep as to fairly cover the whole surface

portion of the seal-visited area at this spot. * * * For the reasons cited in a similar example at Zapadnie, no holluschickie have been driven from this point since 1872, though it is one of the easiest worked. It was in the Russian times a pet sealing ground with them.

JULY 14, 1874.

The vast numbers of the holluschickie on this ground of Polavina, where they have not been disturbed for some five years, to mention in the way of taking, * * *

NOVASTOSHNAH.

JULY 2, 1872.

It was a view of such multitudes of amphibians, when I first stood upon the summit of Hutchinson's Hill and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me courage to maintain the truth in regard to the subject. Hutchinson's Hill is the foundation of this point, which is itself a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner. It is rough, very rough, in spots, and smoother in other places; but everywhere indicated on my chart it has been polished clean and clear of every spear of grass or trace of moss. The hill is about 120 feet high, and has a rounded summit, over which, and swarming up and down over its flanks to the west and the east is an astonishing aggregate of young male seals or holluschickie. These herds, taken together with the 3¼ miles of unbroken rookery belt of solid massed life in reproduction, make a truly amazing sight this afternoon—amazing in its aggregate and infinite in its vast detail.

JULY 16, 1872.

Webster gets all the holluschickie that he wants from one spot on the north shore of the sand-neck beach, west of the foot of the earth itself within those lines, from your sight at frequent intervals, and never let you see more than a scattered glimpse of it at any one place or time; then, sixteen years later, to stand again there, as I stood to-day, and look again upon that same place and the assembled life, and then to see nothing there but a few lonely pods of sheep, and they all timidly huddled down at one margin of this pasture, and so few in number that it required really no effort for you to count them one by one—that is precisely the way this rookery and this hauling ground look to me to-day.

JUNE 25, 1890.

The poverty of these celebrated hauling grounds of Polavina is well illustrated by the catch from the drive to-day (263 skins). At this time in 1872 I could have driven from the great parade plateau behind these breeding grounds, under precisely the same circumstances surrounding the drive to-day, 10,000 killable seals! not one over 4 years old, and very few under 3 years old. Comment is needless.

JULY 2, 1890.

Now, to-day, every good 2-year-old, every 3 and 4 year old was knocked down here, out of this 1,930 animals, to get 240 skins. Where at this rate is the new blood for the rookeries to come in, now so desperately needed? * * *

NOVASTOSHNAH.

JUNE 15, 1890.

Arrived at Webster's House at 12.30 p. m. * * * The two natives stationed here on watch declared that yesterday, which was a fine day, was employed by them in making a circuit of the point; that they carefully inspected the rookery margin and found only about 300 holluschickie hauled immediately up on the north side of the sealions on the neck. Peter Peshenkov declared that nowhere else was there any holluschickie; that there were a few polseacatchie on the beach just below the south shoulder, and nothing in the line of killable seals, except under the north slope of Hutchinson's Hill, about 200 good ones.

JULY 13, 1890.

Fowler had over 5,000 seals driven up this morning, and when he had finished the killing he had only 473 skins. All the rest too small; chiefly last year's pups. Then in the afternoon, rain coming up, he made a rapid drive of those holluschickie which he had been saving for to-morrow, fearing that the rain would send them into the sea, and secured 168 more, making a total of 641, being the extreme limit reached in any one day's killing up here this year, and a total of 4,135 only. On this day here last year Webster had killed 17,168 seals. Fowler

of Cross Hill. A short drive, and only what he wants for each day's work, is driven. He says that he could kill every day three or four times as many as he does if he had the men here to handle the skins. He takes nothing but large skins, nothing under 7 pounds.

will have no holluschickie to kill to-morrow. Webster killed on the 15th 1,838 more.

* * * The driving up here has radically altered for the worse since 1872–1874. It is a mere raking and scraping now of the rookery margins, no killable seals anywhere else. The parade fields of this once magnificent breeding ground are positively vacant to-day; grass and flowers growing and springing up everywhere all over them. The holluschickie, as they hauled to-day, did not occupy more space than 500 feet by 50 feet in depth upon all the entire extent of this immense habitat of 1872! and the drive of 5,000 seals which we saw on the killing grounds had been scraped from seven different points back of the rookery between the base of Hutchinson's Hill and the southeast terminus of the breeding grounds on the point.

PLATE 21.

A drawing from nature by the author.

VIEW OF THE SAND NECK AND CROSS HILL, NORTHEAST POINT.

Looking up and over from the Big Lake Sand Dunes, Saint Paul Island, July 19, 1890.

SECTION III.

THE METHOD OF DRIVING AND TAKING FUR SEALS ON THE PRIBILOV ISLANDS OF ALASKA, SEASONS OF 1872–1874 AND 1890.

DRIVING.

The increasing difficulty of getting that regular quota of 100,000 young male fur-seal skins annually ever since 1882, due to a steady diminution of supply on the Pribilov Islands, has made it necessary to drive right from the breeding grounds, incessantly, with an annual increased severity during the last six or seven years. The hauling grounds of 1872–1874, which were far distant from these rookeries and upon which large surplus herds of seal rested from the beginning to the end of each season undisturbed, were all abandoned as the seals fell away in numbers, until by 1889–90 grass grew and grows right to the water's edge over them.

The remnants of these herds began as early as 1884 to seek quiet and protection by hauling under the lee of the breeding animals, and in doing so, hauled out and laid down upon the immediate flanks of the breeding cows and bulls, close to them, and often intermingled at the outer edge. Therefore, in order to get the young male seals so hauled, it became necessary as early as 1884–85, to scrape the edges of the rookeries in driving out and up the killable seals: and, in 1889, it was done with great vigor, which was increased, really intensified, during the past season.

This extraordinary driving was never dreamed of in 1872–1874, much less done. Then the young male seals, being in great numbers, landed in the following manner, which I spoke of in 1874:

> By reference to the habit of the fur seal, which I have discussed at length, it is now plain and beyond doubt that two-thirds of all the males which are born, and they are equal in numbers to the females born, are never permitted by the remaining third, strongest by natural selection, to land upon the same breeding ground with the females, which always herd thereupon *en masse*. Hence this great band of bachelor seals, or holluschickie, so fitly termed, when it visits the island, is obliged to live apart entirely, sometimes and some places miles away from the rookeries; and in this admirably perfect method of nature are those seals which can be properly killed without injury to the rookeries, selected and held aside by their own volition: so that the natives can visit and take them without disturbing in the least degree the entire quiet of the breeding grounds, where the stock is perpetuated.

Such was the number and method of the young male seals in 1872–1874. It is very different to-day. From the hour of the first driving of 1890, May 21, up to the close of the season, July 20, all this driving was regularly made from rookery grounds, from the immediate margins of the breeding animals, *with the solitary exception of that one place, Middle Hill*, English Bay, St. Paul Island. *Not a drive was made else-*

where, in the course of which cows and pups and bulls were not disturbed and hustled as the young males were secured. As long as the breeding season was at its height, and the compact, solid organization of the rookeries was unbroken, very few cows were swept into these drives, though the disturbance was incessant and great; but when, after the 18th to the 20th of July, the rutting season subsided and the pups began to pod out, i. e., scatter back over three and five times as much ground as they had previously laid upon, then the cows followed them, and then the young males mixed up right and left and mingled with the herd, since they were no longer attacked or driven here and there by the old bulls. Hence the day or two preceding July 20, was marked by a largely increased number of cows and old bulls in the drives: and, had the driving been permitted later, the nursing cows and old bulls would have been swept into the droves of small male seals by hundreds, where tens had previously been taken in this manner.

The driving of a cow with her udder distended and dragged for miles over rough, sharp rocks, bumping heavily in and out of holes and over tussocks, can not result in ought else than her physical ruin and the death of her young pup which is left behind. Therefore, any driving on these islands which, in order to get the holluschickie, necessitates the sweeping, into that drive, of cows, pups, and bulls, *should terminate instantly on that day it begins;* and since the breaking up and spreading of the breeding animals begins as a rule on the 20th of July (a few days earlier if it should rain hard), that date is the very latest day of permission to drive that can be safely given whenever killing is resumed again for tax and shipment of skins from these islands.

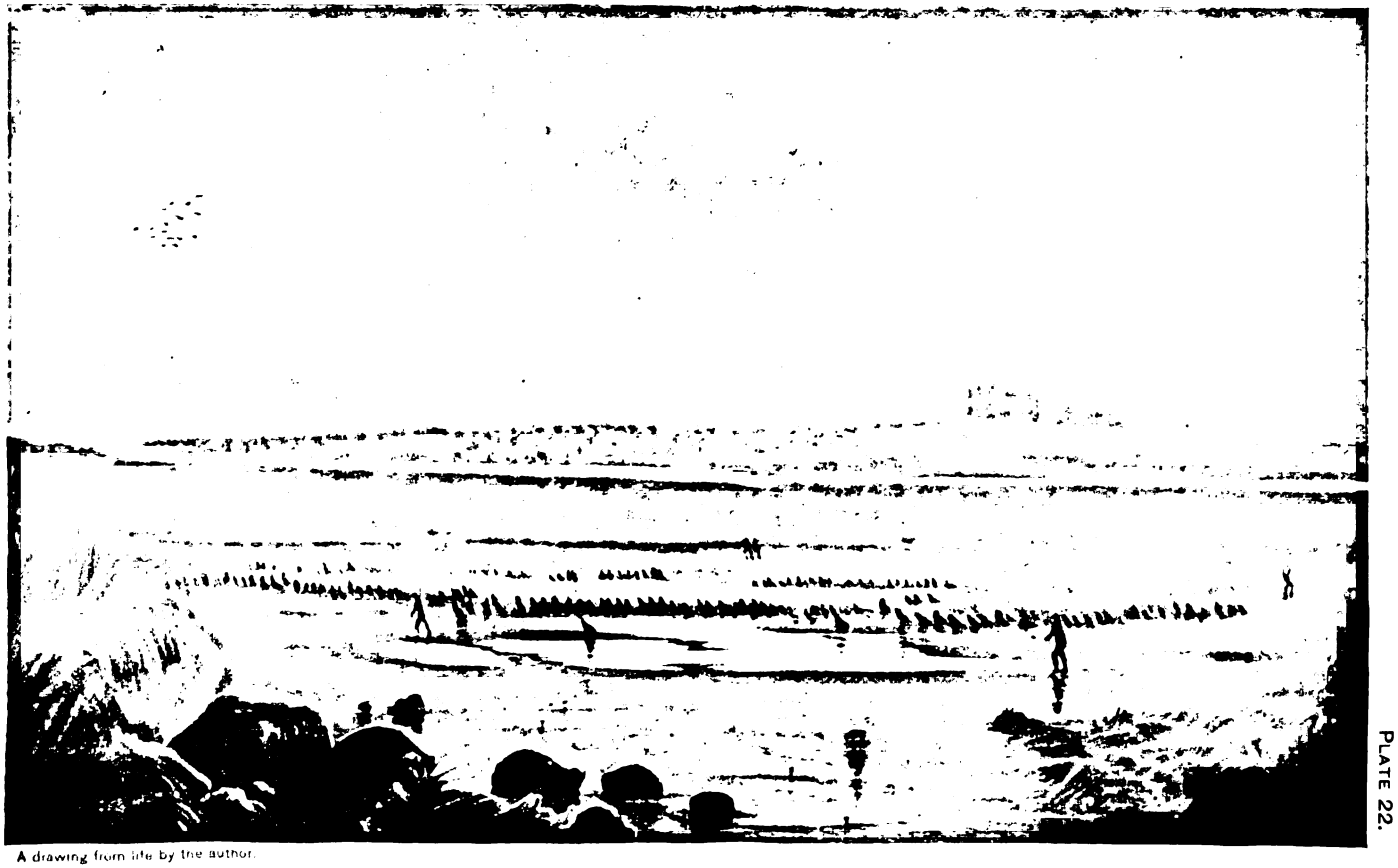
Of course, when seals were in abundance, as in 1872–1879, inclusive, and the sealing gangs never were obliged to go near a rookery to get their quota daily, it did not signify one way or the other as to when and how they went about their work. Then, they never disturbed the breeding animals, no matter when they drove, whether in June, July, or August.

But, to-day, the whole order of hauling is changed. The scanty residuum of that surplus thousands and tens of thousands of killable seals of 1872–1874, haul now in close contact with the rapidly diminishing breeding animals on the rookeries—everywhere, in fact, but on those broad hauling grounds of 1872–1874, as they were wont to do then. They do so naturally and intelligently enough, since it is the last resort for protection and rest that the islands afford.

From the beginning of this season of 1890 (and it was so last year also) the moment a small pod of a few hundred holluschickie hauled up into the rear of a rookery, or appeared on the sand beach just above the surf wash in English Bay under Middle Hill, *that very moment these seals were marked and ordered driven.* They were never allowed to rest long enough to become even acquainted with terra firma ere they were hustled up by the drivers and urged over to the killing grounds.

Last season, during that desperate effort made then to get the catch of 100,000, parties were regularly sent over to drive the holluschickie off from Seevitchie Kammen, from Otter Island, from all points under the high bluffs at Zapadnie and Southwest Point, St. Paul, and the north shore of St. George. This year, however, there were too few hauled out on those spots to warrant this effort. There was no sign of seals hauling at all on Otter Island.

When I expressed my surprise at this ferocious driving, begun early in June, I was met by apparent equal surprise on the part of the drivers, who, wondering at my ignorance, assured me that they had been



A drawing from life by the author.

NATIVE DRIVERS BRINGING IN A DRIVE OF HOLLUSCHICKIE, SAINT PAUL ISLAND, JULY 4, 1872.

View looking over the Lagoon flats and Village Cove, with Tolstoi in the distance on the right. This drive has been brought over from Tolstoi.

PLATE 22.

driving seals in this method ever since 1885—"had been obliged to or go without the seals."[1]

The driving itself, in so far as the conduct of the natives conducting the labor was concerned, was as carefully and well done as it could be. They avoided to the very best of their ability, any undue urging or hastening of the drive overland from the rookeries; they avoided as nearly as they could, under the circumstances, sweeping up pods of cows and pups; did all that they could to make as little disturbance among the breeding animals as possible. But even with all their care and sincere reluctance to disturb the rookeries, cows were repeatedly taken up in their scraping drives on the margins of all the rookeries, and their pups left floundering behind to starve and perish ultimately.

The manner to-day of driving overland to the killing grounds is unchanged from the method of 1872; but the regular driving from every spot resorted to by the holluschickie on both islands has caused the establishment of killing grounds and a salt house as early as 1879 at Stony Point (Tonkie Mees), and a slaughter field at Zapadnie, on St. Paul, the skins being taken from the latter point by a bidarrah, to the village (which was sent over from there every time a killing was made), and they are now hauled down in wagons (mule teams) from the former locality to the salt houses of St. Paul.

In 1872–1874 the work of getting the seals on the killing grounds was conducted in the following manner:

The manner in which the natives captured and drove the holluschickie up from the hauling grounds to the slaughter fields near the two villages of St. Paul and St. George and elsewhere on the islands was then deemed all right. It was in this way: At the beginning of every sealing season, that is, during May and June, large bodies of young bachelor seals do not haul up on land very far from the water, a few rods at the most, and when these first arrivals are sought after, the natives, in capturing them, are obliged to approach slily and run quickly between the dozing seals and the surf before they can take alarm and bolt into the sea. In this manner a dozen Aleuts, running down the sand beach of English Bay in the early morning of some June day, will turn back from the water thousands of seals, just as the moldboard of a plow lays over and back a furrow of earth. When the sleeping seals are first startled they arise and, seeing men between them and the water, immediately turn, lope, and scramble rapidly back up and over the land. The natives then leisurely walk on the flanks and in the rear of the

[1] The subjoined extract from my field notes under date of Sunday, July 13, 1890: "Walked up to Northeast Point this morning for the purpose of platting the area and position of the breeding seals on Novastoshnah and the Polavinas; also to see the natives drive at Polavina. I was on the ground at 5 a. m. and saw the whole modus operandi at this place. The holluschickie haul close up against the sand beach drop to the rookery at Polavina: then the drivers, in getting the young males, swept four cows into the drove, and their pups were left behind them on the sand, bruised, mauled, and paralyzed by the stampeding flippers of the herd. To get the holluschickie they are obliged to drive in this violent manner. Another squad of, say, 1,000, mostly 2-year-olds and yearlings, was swept up by these drivers on the parade plateau, and another squad was driven from Little Polavina rookery, the first drive that the natives have been able to find there thus far this season. Along the entire spread of Lukannon, Polavina, and Northeast Point sand beach—8 miles, nearly, of it—I did not see a single young seal—only a dozen or two worthless bulls scattered here and there at wide intervals. Over this extent and at this time in 1872 such a walk as mine this morning would have brought me in contact with and in sight of 50,000 to 100,000 holluschickie! and the weather now simply superb hauling weather all day yesterday, last night, and this morning."

drove thus secured, directing and driving it over to the killing grounds close by the village.[1]

PROGRESSION OF A SEAL DRIVE.

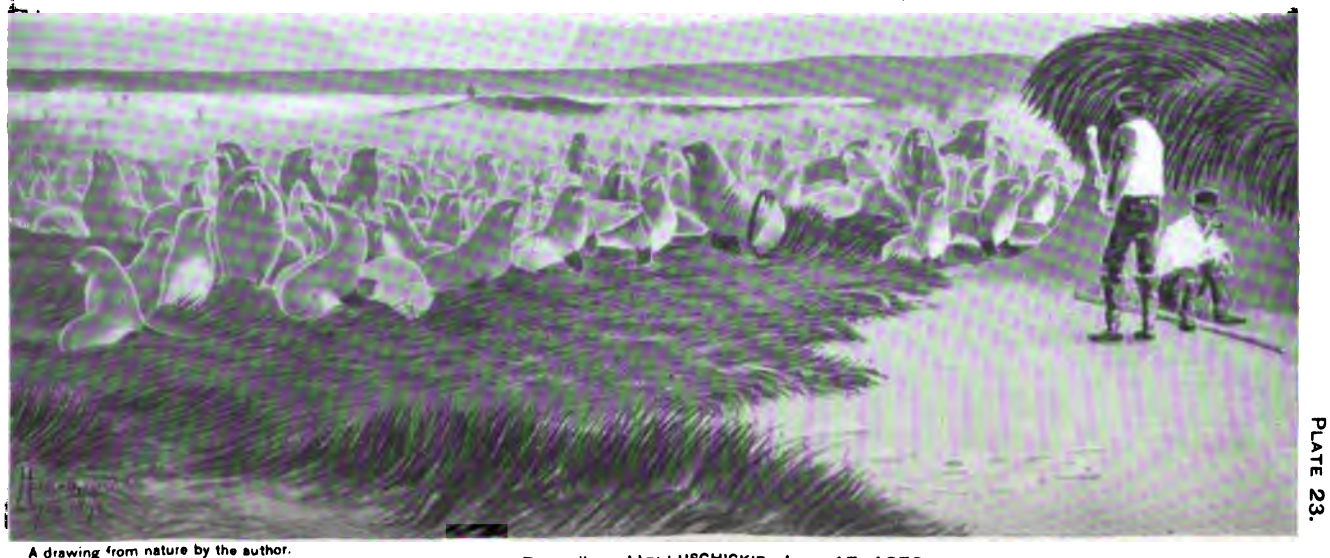
A drove of seals on hard or firm, grassy ground, in cool and moist weather, may be driven with safety, at the rate of half a mile an hour. They can be urged along, with the expenditure of a great many lives, however, at the speed of a mile or a mile and a quarter per hour: but, this is seldom done. An old bull seal, fat and unwieldy, can not travel with the younger ones, though it can lope or gallop as it starts across the ground as fast as an ordinary man can run over 100 yards: but, then it fails utterly, falls to the earth supine, entirely exhausted, hot, and gasping for breath.

The holluschickie are urged along the path leading to the killing grounds with very little trouble, and require only three or four men to guide and secure as many thousands at a time. They are permitted frequently to halt and cool off, as heating them injures their fur. These seal halts on the road always impressed me with a species of sentimentalism and regard for the creatures themselves. The men dropping back for a few moments: the awkward shambling and scuffling of the march at once ceases, and the seals stop in their tracks to fan themselves with their hind flippers, while their heaving flanks give rise to subdued, panting sounds. As soon as they apparently cease to gasp for want of breath and are cooled off comparatively, the natives step up once

[1] The task of getting up early in the morning and going out to the several hauling grounds closely adjacent, is really all there is of the labor involved in securing the number of seals required for the day's work on the killing grounds. The two, three, or four natives upon whom, in rotation, this duty is devolved by the order of their chief, rise at first glimpse of dawn, between 1 and 2 o'clock, and hasten over to Lukannon, Tolstoi, or Zoltoi, as the case may be, "walk out" their holluschickie, and have them duly on the slaughtering field before 6 or 7 o'clock, as a rule, in the morning. In favorable weather the drive from Tolstoi consumes two and a half to three hours' times; from Lukannon about two hours, and is often done in an hour and a half; while Zoltoi is so near by that the time is merely nominal.

I heard a great deal of talk among the white residents of St. Paul when I first landed and the sealing season opened, about the necessity of "resting" the hauling grounds; in other words they said that if the seals were driven in repeated daily rotation from any one of the hauling grounds, that this would so disturb these animals as to prevent their coming to any extent again thereon during the rest of the season. This theory seemed rational enough to me at the beginning of my investigations, and I was not disposed to question its accuracy; but, subsequent observation directed to this point, particularly satisfied me, and the sealers themselves with whom I was associated, that the driving of the seals had no effect whatever upon the hauling which took place soon or immediately after the field, had been swept clean of seals by the drivers, for that hour. If the weather was favorable for landing, i. e., cool, moist, and foggy, the fresh hauling of the holluschickie would cover the bare grounds again in a very short space of time. Sometimes in a few hours after the driving of every seal from Zoltoi sands over to the killing fields adjacent, those dunes and the beach in question, would be swarming anew with fresh arrivals. If, however, the weather is abnormally warm and sunny, during its prevalence, even if for several consecutive days, no seals to speak of, will haul out on the emptied space. Indeed, if these holluschickie had not been taken away by man from Zoltoi or any other hauling ground on the island, when "tayopli" weather prevailed, most of those seals would have vacated their terrestrial loafing places for the cooler embraces of the sea.

The importance of understanding this fact as to the readiness of the holluschickie to haul promptly out on steadily "swept" ground, provided the weather is inviting, is very great; because, when not understood, it was deemed necessary, even as late as the season of 1872, to "rest" the hauling grounds near the village (from which all the driving has been made since), and make trips to far-away Polavina and distant Zapadnie—an unnecessary expenditure of human time, and a causeless infliction of physical misery upon phocine backs and flippers.



A drawing from nature by the author.

A ZOLTOI "DRIVE" OF HOLLUSCHICKIE, JULY 17, 1872.
The herd in waiting on the killing grounds, village of Saint Paul.

PLATE 23.

more, clatter a few bones with a shout along the line, and the seal shamble begins again—their march to death and the markets of the world is taken up anew.

DOCILITY OF FUR SEALS WHEN DRIVEN.

I was also impressed by the singular docility and amiability of these animals when driven along the road. They never show fight any more than a flock of sheep would do. If, however, a few old seals get mixed in, they usually get so weary that they prefer to come to a standstill and fight rather than move; otherwise, no sign whatever of resistance is made by the drove from the moment it is intercepted and turned up from the hauling grounds, to that time of its destruction at the hands of the sealing gang.

This disposition of the old seals to fight rather than endure the panting torture of travel, is of great advantage to all parties concerned, for they are worthless, commercially: and, the natives are only too glad to let them drop behind, where they remain unmolested, eventually returning to the sea. The fur on them is of little or no value; their under wool being very much shorter, coarser, and more scant than in the younger; especially so on the posterior parts along the median line of the back.

It is quite impossible, however, to get them all of one age without an extraordinary amount of stir and bustle, which the Aleuts do not like to precipitate. Hence the drive will be found to consist usually of a bare majority of 3 and 4 year olds, the rest being 2-year-olds principally, and a very few at wide intervals of 5-year-olds, the yearlings seldom ever getting mixed up prior to the 20th July, annually.

METHOD OF LAND TRAVEL.

As the drove progresses along the path to the slaughtering grounds the seals all move in about the same way; they go ahead with a kind of walking step and a sliding, shambling gallop. The progression of the whole caravan is a succession of starts, spasmodic and irregular, made every few minutes, the seals pausing to catch their breath and make, as it were, a plaintive survey and mute protest. Every now and then a seal will get weak in the lumbar region, then drag its posteriors along for a short distance, finally drop breathless and exhausted, quivering and panting, not to revive for hours, days, perhaps, and often never. During the dryest driving days, or those days when the temperature does not combine with wet fog to keep the path moist and cool, quite a large number of the weakest animals in the drove will be thus laid out and left on the track. If one of these prostrate seals is not too much heated at the time, the native driver usually taps the beast over the head and removes its skin.[1]

[1] The fur seal, like all of the pinnipeds, has no sweat glands. Hence, when it is heated, it cools off by the same process of panting which is so characteristic of the dog, accompanied by the fanning that I have hitherto fully described. The heavy breathing and low grunting of a tired drove of seals on a warmer day than usual, can be heard several hundred yards away. It is surprising how quickly the hair and fur will come out of the skin of a blood-heated seal—literally rubs off bodily at a touch of the finger. A fine specimen of a 3-year-old holluschickie fell in its tracks at the head of the Lagoon while being driven to the village killing grounds. I asked that it be skinned with special reference to mounting. Accordingly a native was sent for, who was on the spot, knife in hand, within less than thirty minutes from the moment that this seal fell in the road: yet, soon after he had got fairly to work, patches of the fur and hair came off here and there, wherever he chanced to clutch the skin.

PROSTRATION OF FUR SEALS BY HEAT.

This prostration from exertion will always happen, no matter how carefully they are driven; and in the longer drives, such as 2½ and 5 miles from Zapadnie on the west, or from Polavina on the north, to the village at St. Paul, as much as 3 or 4 per cent of the whole drive will be thus dropped on the road. Hence I felt and feel satisfied, from my observation and close attention to this feature, that a considerable number of those that are thus rejected from the drove and are able to rally and return to the water die subsequently from internal injuries sustained on the trip, superinduced by this overexertion. I therefore think it highly improper and impolitic to extend the drives of the holluschickie over any distance on St. Paul Island exceeding a mile, or a mile and a half. It is better for all parties concerned, and the business, too, that salt houses be erected and killing grounds established contiguous to all of the great hauling grounds, 2 miles distant from the village on St. Paul Island, should the business ever be developed above the present limit, or should the exigencies of the future require a quota from all these places in order to make up the 100,000 which may be lawfully taken. I used this language in 1874 and repeat it to-day.

ABUNDANT SUPPLY OF HOLLUSCHICKIE.

As matters were in 1874, 100,000 seals alone on St. Paul were taken and skinned in less than forty working days within a radius of 1½ miles from the village, and from the salt house at Northeast Point. Hence the driving, with the exception of two experimental droves which I witnessed in 1872, has never been made from longer distances than Tolstoi to the eastward, Lukannon to the northward, and Zoltoi to the southward of the killing grounds at St. Paul village, and I then said should, however, an abnormal season recur, in which the larger proportion of days during the right period for taking the skins be warmish and dry, it might be necessary, in order to get even 75,000 seals within the twenty-eight or thirty days of their prime condition, for drives to be made from the other great hauling grounds to the westward and northward, which are now, and have been for the last ten years, entirely unnoticed by the sealers.

KILLING THE SEALS.

The seals, when finally driven upon those flats between the East landing and the village, and almost under the windows of the dwellings, were in 1872, and are herded there now, until cool and rested. The drives are usually made very early in the morning, at the first breaking of day, which is half past 1 or 2 o'clock of June and July in these latitudes.

They arrive and cool off on the slaughtering grounds, so that by 6 or 7 o'clock, after breakfast, the able-bodied male population turn out from the village and go down to engage in the work of slaughter. The men are dressed in their ordinary working garb of thick flannel shirts, stout cassimere or canvas pants, over which the "tarbossa" boots are drawn. If it rains they wear their "kamlaikas," made of the intestines and throats of the sea lion and fur seal. Thus dressed they are each armed with a club, a stout oaken or hickory bludgeon, which has been made particularly for the purpose at New London, Conn., and imported here for this especial service. These sealing clubs are about 5 or 6 feet in length, 3 inches in diameter at their heads, and the thickness of a man's

A drawing from nature by the author.

EAST LANDING.

PLATE 24.

THE KILLING GANG AT WORK ON THE VILLAGE SLAUGHTER FIELD, SAINT PAUL ISLAND, JULY 4, 1872.

View looking over to the Black Bluffs and East Landing, from the village salt houses. [To-day the clubbing is done by only three or four men, who do nothing else; the rest "flipper" and "skin."]

forearm where they are grasped by the hands. Each native also has his stabbing knife, his skinning knife, and his whetstone. These are laid upon the grass convenient when the work of braining or knocking the seals down is in progress. This is all the apparatus which they have for killing and skinning.

THE KILLING GANG AT WORK.

When the men gather for this work, they are under the control of their chosen foremen or chiefs—usually on St. Paul divided into two working parties at the village, and a subparty at Northeast Point, where another salt house and slaughtering field is established. At the signal of the chief the work of the day begins by two of the men stepping into the drove corraled on the flats, and driving out from it 50 or 100 seals at a time, making what they call a "pod," which they surround in a circle, huddling the seals one on another as they narrow it down, until they are directly within reach and under their clubs. Then the chief, after he has cast his experienced eye over the struggling, writhing "kautickie" in the center, passes the word that such and such a seal is bitten, that such and such a seal is too young, that such and such a seal is too old. The attention of his men being called to these points, he gives the word "strike!" and instantly the heavy clubs come down all around, and every one that is eligible, is stretched out stunned and motionless, in less time really than I take to tell it. Those seals spared by the order of the chief now struggle from under and over the bodies of their insensible companions and pass, hustled off by the natives, back to the sea.[1]

The clubs are dropped, the men seize the prostrate seals by the hind flippers and drag them out, so they are spread on the ground without touching each other. Then every sealer takes his knife and drives it into the heart at a point between the fore flippers of each stunned form. The blood gushes forth, and the quivering of the animal presently ceases. A single stroke of a heavy oak bludgeon, well and fairly delivered, will crush in at once the slight, thin bones of a fur seal's skull, and lay the creature out almost lifeless. These blows are, however, usually repeated two or three times with each animal, but they are very quickly done. The bleeding, which is immediately effected, is so speedily undertaken in order that the strange reaction, which the sealers call "heating," shall be delayed for half an hour or so, or until the seals can all be drawn out, and laid in some disposition for skinning.

I have noticed that within less than thirty minutes from the time a perfectly sound seal was knocked down, it had so "heated," owing to the day being warmer and drier than usual, that when touching it with my foot great patches of hair and fur scaled off. This is a rather excep-

[1]The aim and force with which the native directs his blow determines the death of the seal. If struck direct and violently, a single stroke is enough. The seals' heads are stricken so hard, sometimes, that those crystaline lenses to their eyes fly out from the orbital sockets like hail stones or little pebbles, and have frequently struck me sharply in the face or elsewhere, while I stood near by, watching the killing gang at work.

A singular, lurid green light suddenly suffuses the eye of the fur seal at intervals when it is very much excited, as the "podding" for the clubbers is in progress; and at the moment, when, last raising its head, it sees the uplifted bludgeons on every hand above, fear seems then for the first time to possess it and to instantly gild its eye in this strange manner. When the seal is brained in this state of optical coloration I have noticed that the opalescent tinting remained well defined for many hours, or a whole day after death. These remarkable flashes are very characteristic to the eyes of the old males during their hurly-burly on the rookeries: but, never appear in the younger classes unless as just described, as far as I could observe.

tionally rapid metamorphosis; it will, however, take place in every instance within an hour or an hour and a half on these warm days after the first blow is struck and the seal is quiet in death. Hence, no time is lost by the prudent chief in directing the removal of the skins as rapidly as the seals are knocked down, and dragged out. If it is a cool day, after bleeding the first "pod" which has been prostrated in the manner described, and after carefully drawing the slain from the heap in which they have fallen, so that the bodies will spread over the ground just free from touching one another, the men turn to and strike down another "pod," and so on until a whole thousand, or two, are laid out, or the drove as corraled, is finished. The day, however, must be raw and cold for this wholesale method. Then, after killing, they turn to work and skin; but if it is a warm day every pod is skinned as soon as it is knocked down.

The labor of skinning is exceedingly severe, and is trying even to an expert, demanding long practice ere the muscles of the back and thighs are so developed as to permit a man to bend down to and finish well a fair day's work. The knives used by the natives for skinning are ordinary kitchen or case-handled butcher knives. They are sharpened to cutting edges, as keen as razors: but, something about the skins of the seal, perhaps fine, comminuted sand along the abdomen, so dulls these knives as the natives work, that they are constantly obliged to whet them while busy stripping the pelts.

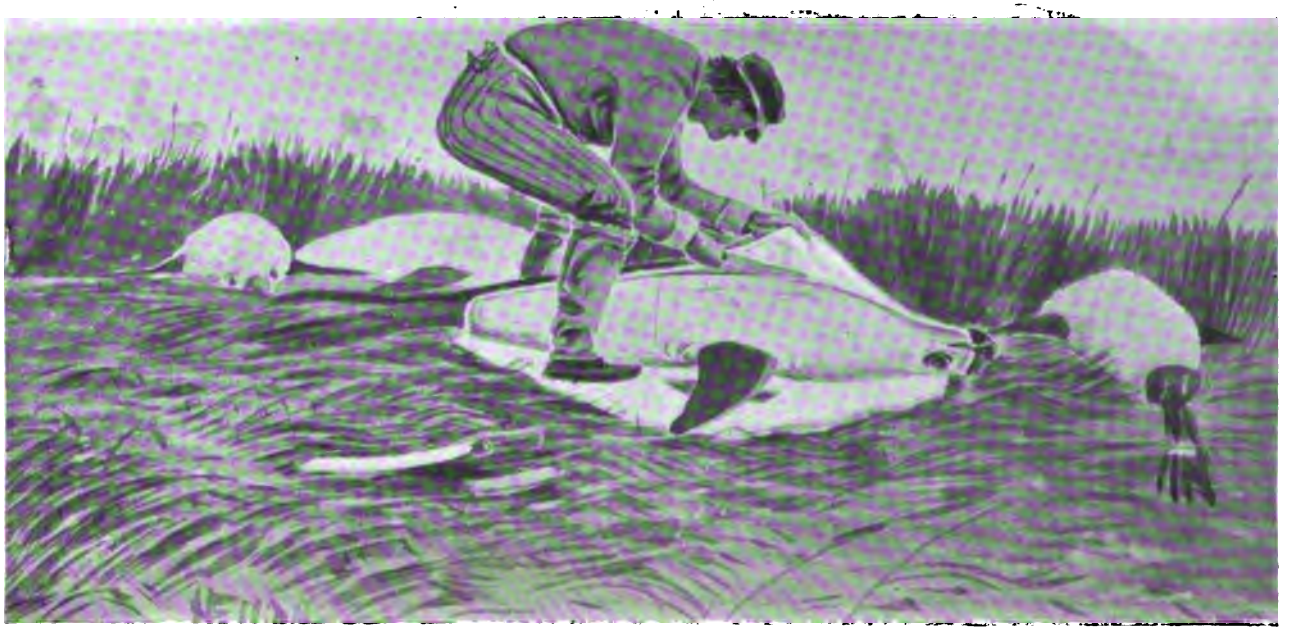
The body of the seal, preparatory to skinning, is rolled over and balanced squarely on its back; then the native makes a single swift cut through the skin down along the neck, chest, and belly, from the lower jaw to the root of the tail, using for this purpose his long stabbing knife.[1] The fore and hind flippers are then successively lifted as the man straddles the seal, and stoops down to his work over it; then a sweeping circular incision is made through the skin on them, just at the point where the body fur ends. Then, seizing a flap of the hide on either one side or the other of the abdomen, the man proceeds with his smaller, shorter butcher

[1] When turning these stunned and senseless carcasses the only physical danger of which the sealers run the slightest risk, during the whole circuit of their work, occurs thus: At this moment the prone and quivering body of the holluschickie is not wholly inert, perhaps, though it is nine times out of ten: and, as the native takes hold of a fore flipper to jerk the carcass over on to its back the half-brained seal arouses, snaps suddenly and viciously, often biting the hands or legs of the unwary skinners, who then come leisurely and unconcernedly up into the surgeon's office at the village for bandages, etc. A few men are bitten every day or two, during the season on the islands in this manner, but I have never learned of any serious result following any case. The sealers, as might be expected, become exceedingly expert in keeping their knives sharp, putting edges on them as keen as razors, and in an instant detect any dullness by passing the balls of their thumbs over the suspected edges to the blades. The white sealers of the Antarctic always used the orthodox butchers' "steel" in sharpening their knives: but, these natives never have, and probably never will abandon those little whetstones above referred to.

During the Russian management, and throughout the strife in killing by our own people in 1868, a very large number of the skins were cut through, here and there, by the slipping of the natives' knives when they were cutting them from the carcasses and "flensing" them from the superabundance, in spots, of blubber. These knife cuts through the skin, no matter how slight, give great annoyance to the dresser; hence they are always marked down in price. The prompt scrutiny of each skin on the islands by the agent of the Alaska Commercial Company, who rejects everyone of them thus injured, has caused the natives to exercise great care, and the number now so damaged every season is absolutely trifling.

Another source of small loss is due to a habit which the holluschickie have of occasionally biting one another when they are being urged along in the drives, and thus crowded, once in awhile, one upon the other. Usually these examples of "zoobäden" are detected by the natives prior to the "knocking down," and spared. Yet those which have been nipped on the chest or abdomen can not be thus noticed, and until the skin is lifted the damage is not apprehen ded.

PLATE 25.



A drawing from nature by the author.

SEAL ISLAND NATIVE AT WORK SKINNING A FUR SEAL.

"Rolling the carcass out;" on the killing grounds, village of Saint Paul.

knife to rapidly cut the skin clean and free from the body (and blubber), which he rolls over and out from the hide, by hauling up on it as he advances with his work, standing all this time stooped over the carcass so that his hands are but slightly above it, or the ground. This operation of skinning a fair-sized holluschickie *takes the best men only one minute and a half!* but the average time made by the gang on the ground is about four minutes to the seal. Nothing is left of the skin upon the carcass save a small patch of each upper lip on which the coarse mustache grows, the skin on the tip of the lower jaw, the insignificant tail,[1] together with the bare hide of the flippers.

During the last five, six, or seven years, a somewhat different method has been in vogue, by which change the work has been expedited very much. Two or three white men, servants of the company leasing the islands, together with two or three of the natives, alone constitute the killing or clubbing force. They make the selection and knock down the killable seals as the pods are driven up by them in swift rotation; then, four or five of the younger sealers constitute a force known as the "flippering" and stabbing or "sticking" men. These workmen seize each seal, immediately after it is knocked down, and plunge a long knife into its heart at a point directly in the center of its chest between its fore flippers; then, with a single swift sweep of this knife, the skin of the prostrate seal is cut through to the blubber in a straight line from the rims of the lower jaws to the fundament; another circular sweep cuts the skin right around the head so as to just leave all that forward of the eyes and the tip of the lower jaws; then another sweep of the keen blade cuts the furred skin clear from its junction into each naked fore flipper, and a final sweep separates it from the same junction with its hind flippers and the abortive tail. This done, the work of the flippering man ceases: and, he is succeeded in turn by the regular skinner, who steps in soon after, and quickly completes the skinning out of the carcass, as was done in 1872 and described above.

The wooden clubs and steel knives are not essentially different to-day from those used in 1872: and, the treatment of the skins not materially changed in the salt houses; only they are cured more rapidly: salted over, and changed five days after first salting, into a fresh kench, where they lie ready for final binding in ten or twelve days' time from date of first salting. I say five days after first salting, because it is done as soon as that, if possible, though it is not essential—ten days often elapses. This resalting is necessary to insure a complete curing of the edges of the pelts. If it is not done, then a

[1] This tail of the fur seal is just a suggestion of the article and that is all. Unlike the abbreviated caudal extremities of the bear or the rabbit, it does not seem to be under the slightest control of its owner—at least I never could see it move to any appreciable degree—when the seal is in action on land. Certainly there is no service required of it: but it does appear to me rather singular that none of the changeful moods of *Callorhinus* are capable of giving rise to even a tremor in its short stump of a tail. It is never raised or depressed, and in fact amounts to a mere excrescence, which many casual observers would not notice. The shrinking, twitching movements of the seal skin here and there at irregular intervals are especially noticed when that animal is asleep, so that even when awake I believe that dermatological motion is an involuntary one. The tail of the sea lion is equally inconsequential; that of the walrus, even more so, while *Phoca vitulina* has one a trifle longer, relatively, and much stouter, fleshier than that of the fur seal.

I found that the natives here were pronounced evolutionists, as are all the many Indian tribes with which I have been thrown in contact during my travels from Mexico to the head of the Stickeen River. They declare that their remote ancestry undoubtedly were fur seals. Indeed, there is a better showing for the brain cases of the fur seal over that of the monkey's skull, as to weight with reference to physical bulk, while their tails are as short or even shorter than most of the anthropoid apes!

great many "soft" spots will be found on the outer edges of the skins from which the fur pulls out, and thus destroys the par value of those skins.

Touching this subject in 1874, I said in relation to the work:

The skins are taken from the field[1] to the salt house, where they are laid out, after being again carefully examined, one upon another, "hair to fat," like so many sheets of paper, with salt profusely spread upon the fleshy sides as they are piled up in the "kenches" or bins.[2] The salt house is a large barn-like frame structure, so built as to afford one-third of its width in the center, from end, to end clear and open as a passageway: while on each side are rows of stanchions, with sliding planks, which are taken down and put up in the form of deep bins or boxes—"kenches," the sealers call them. As the pile of skins is laid at the bottom of an empty "kench," and salt thrown in on the outer edges, these planks are also put in place, so that the salt may be kept intact until the bin is filled as high up as a man can toss the skins. After lying two or three weeks in this style, they become "pickled," and they are suited then at any time to be taken up and rolled into bundles of two skins to the package, with the hairy side out, tightly corded, ready for shipment from the islands.

The bundled skins are carried from the salt houses to the baidar, when the order for shipment is given, and pitched into that lighter one by one, to be rapidly stowed: 700 to 1,200 bundles making the average single load. Then, when alongside the steamer, they are again tossed up and on to her deck, from whence they are stowed again in the hold.

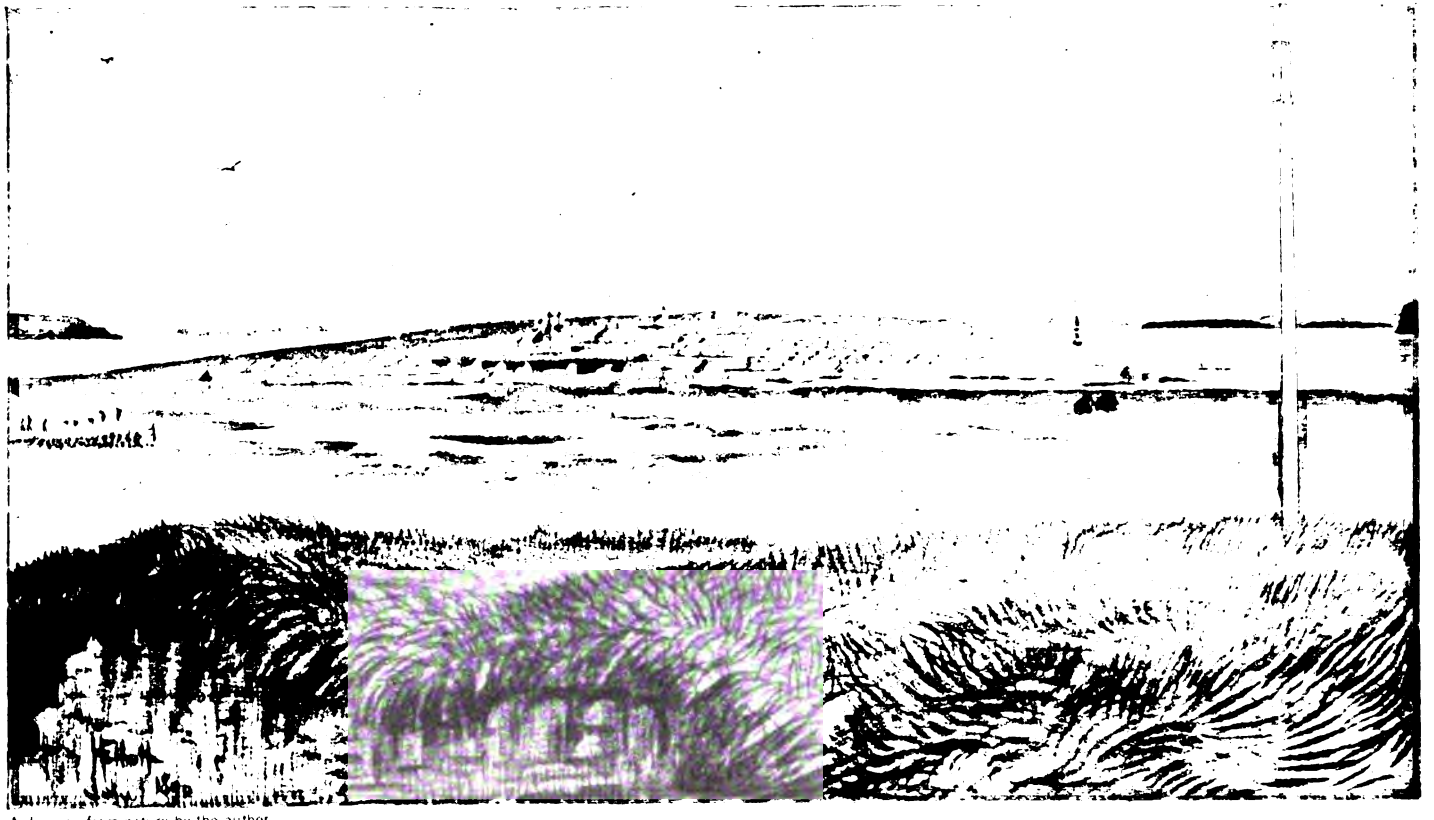
DESCRIPTION OF KILLING GROUND AT ST. PAUL VILLAGE.

The killing ground of St. Paul is a bottomless sand flat, only a few feet above high water, which unites the village hill and the reef with the island itself. It is not a stone's throw from the heart of the settlement—in fact, it is right in town—not even suburban: and, a most singular and striking characteristic of the island of St. Paul is the fact that this immense slaughtering field, upon which 55,000 to 70,000 fresh carcasses

[1] Under the old order of affairs, long prior to the present management, the skins were packed up and carried on the backs of the boys and girls, women and old men, to the drying houses and drying frames. When I first arrived, season of 1872, a slight variation was made in this respect by breaking a small Siberian bull into harness and hitching it to a bob cart in which the pelts were hauled. Before the cart was adjusted, however, and the "buik" taught to pull, it was led out to the killing grounds by a ring in its nose, and literally covered with the green seal hides, which were thus packed to the kenches. The natives were delighted with even this partial assistance, but now they have no further concern about it at all, for several mules and carts render prompt and ample service. They were introduced here first in 1874. The Russian American Company, and also the Alaska Commercial Company have brought up three or four horses to St. Paul: but they have been unfortunate in losing them all soon after landing: the voyage and the climate combined, being inimical to equine health. But the mules of the present order of affairs, have been successful in their transportation to and residence on the Pribilov Islands. One of the first of these horses just referred to, perhaps did not have a fair chance for its life. It was saddled one morning and several camp kettles, coffee pots, etc., slung on the crupper for the use of the Russian agent, who was going up to Northeast Point for a week or ten days' visit. He got into the saddle, and while en route, near Polavina, a kettle or pot broke loose behind. The alarmed horse kicked its rider promptly off, and disappeared on a full run in the fog, going toward the bogs of Kamminista, where its lifeless and fox-gnawed body was found several days afterwards.

[2] The practice of curing in early times was quite different from this rapid and effective process of salting. The skins were then all house, or air dried, pegged out when "green" upon the ground, or else stretched upon a wooden trellis or frame, which stood like a rude fence adjacent to the killing grounds. It was the accumulation of such air-dried skins from the Pribilov Islands at Sitka which rotted so in 1803 that "750,000 of them were cut up or thrown into the sea," and so destroyed. Had they been treated as they now are, such a calamity and hideous waste could not have occurred. The method of air drying which the old settlers employed is well portrayed by the practice of the natives now, who treat a few hundred sea-lions' skins to the process every fall, preparing them thus for shipment to Unalashka, where they are used by brother Aleuts in covering their bidarkies or kyacks. The natives, in speaking to me of this matter, said that whenever the weather was rough and the wind blowing hard, these air-dried seal skins, as they were tossed from the bidarrah to the ship's deck, numbers of them would frequently turn in the wind and fly clean over the vessel into the water beyond, where they were lost.

PLATE 26.



A drawing from nature by the author.
ZOLTOI BAY.

THE VILLAGE COVE, LOOKING OVER TO ZAPADNIE ACROSS ENGLISH BAY.

VILLAGE OF SAINT PAUL, JULY 4, 1890.

View over the village killing grounds from the flagstaff at the East Landing on the Black Bluffs.

have laid every season, since 1854, sloughing away into the sand beneath, has not and does not cause any sickness among the people who live right over them, so to speak. The cool, raw temperature and strong winds peculiar to the place seem to prevent any unhealthy effect from the fermentation of decay. The *Elymus* and other grasses once more take heart and grow with magical vigor over that unsightly spot, to which the sealing gang again returns, repeating their bateau, which we have marked before upon this place, three years ago. In that way, this strip of ground, seen on my map between the village, the East landing, and the Lagoon, contains the bones and the oil drippings and other fragments thereof, of more than 4,000,000 seals slain since 1786, while the slaughter fields at Novastoshnah record the end of a million more!

I remember well the unmitigated sensations of disgust that possessed me when I first landed, April 26, 1872, on the Pribilov Islands, and passed up, from the beach at Lukannon, to the village over the killing grounds. Though there was a heavy coat of snow on the fields, yet each and every one of the 55,000 decaying carcasses was there, and bare: having burned, as it were, their way out to the open air, polluting the same to a sad degree. I was laughed at by the residents who noticed my facial contortions, and assured that this state of smell was nothing to what I should soon experience when the frost and snow had fairly melted. They were correct; the odor along by the end of May was terrific punishment to my olfactories, and continued so for several weeks until my sense of smell became blunted and callous to this stench by long familiarity. Like the old residents, I then became quite unconscious of the prevalence of this rich "funk" and ceased to notice it.

Those who land here, as I did, for the first time, nervously and invariably declare that such an atmosphere must breed a plague or a fever of some kind in the village, and hardly credit the assurance of those who have resided in it for the whole period of their lives, that such a thing was never known to St. Paul, and that the island is remarkably healthy. It is entirely true, however, and after a few weeks' contact or a couple of months' experience at the longest, the most sensitive nose becomes used to that aroma, wafted, as it is, hourly, day in and out, from decaying seal flesh, viscera, and blubber; and, also, it ceases to be an object of attention. The cool, sunless climate during the warmer months has undoubtedly much to do with checking too rapid decomposition and consequent trouble therefrom, which would otherwise arise from the killing grounds.

The freshly skinned carcasses of this season, do not seem to rot, substantially, until the following year. Then, they rapidly slough away into the sand upon which they rest. The envelope of blubber left upon each body, seems to act as an air-tight receiver, holding most of the putrid gases that are evolved from the decaying viscera until their volatile tension causes it to give way. Fortunately, the line of least resistance to that merciful retort, is usually right where it is adjacent to the soil: so, both putrescent fluids and much of the stench within, is deodorized and absorbed before it can contaminate the atmosphere to any great extent. The truth of my observation will be promptly verified if the skeptic chooses to tear open any one of the thousands of gas-distended carcasses in the fall that were skinned in the killing season. If he does so, he will be smitten by the worst smell that human sense can measure; and should he chance to be accompanied by a native, that callous individual will even pinch his grimy nose and exclaim, it is a "keeshla pahnoot!"

At the close of the third season after the skinning of the seal's body, it will have so rotted and sloughed down as to be marked only by the

SECTION IV.

THE SELECTION OF FUR-SEAL SKINS ON THE PRIBILOV ISLANDS, GRADE AND SUPPLY, SEASONS OF 1872–1874 AND 1890.

As the law of 1870 permits the lessees of the seal islands to kill male seals of any age that they may select from the herds of holluschickie there assembled, above 1 year old, this selection has been very rigorously made from the beginning of the leasing in 1870. It is entirely natural, and in accord with business sense that the aim should have been, every year, to get only that single grade of skins which will bring the most money in the best market, at London, England.

In that regular effort made since 1870, to get annually 100,000 seal skins, all to be of the best possible grade, it has been customary during each season to drive up to the killing grounds every herd as it was found hauled out. Then, when ready to kill, pods of from 50 to 100 animals at a time would be taken from this herd, as driven, and then only those of the best grade in that pod were clubbed: the rest being permitted to shamble off and back to the sea. The grade for each summer's work was proclaimed by the general superintendent of the lessees on the islands, before the work of the killing season opened; and the clubbing of the pods was then executed in accordance with this order. Therefore, no seals were killed above that standard set, or below it: no matter how many or how few were driven up.

This growth and grading of the fur seal on the Pribilov Islands I found last summer to be the same as it was in 1872–1874. The following table expresses it:

Table showing the weight, size, and growth of the fur seal (Callorhinus ursinus), from the pup to the adult, male and female.

Age.	Length	Girth.	Gross weight of body.	Weight of skin.	Remarks.
	Inches.	*Inches.*	*Pounds.*	*Pounds.*	
One week	12–14	10–10½	6–7½	1¼	A male and female, being the only ones of the class handled, June 20, 1873.
Six months	24	25	39	3	A mean of 10 examples, males and females, alike in size, November 28, 1873.
One year	38	25	39	4½	A mean of 6 examples, males and females, alike in size, July 14, 1873.
Two years	45	30	58	5½	A mean of 30 examples, all males, July 24, 1873.
Three years	52	36	87	7	A mean of 32 examples, all males, July 24, 1873.
Four years	58	42	135	12	A mean of 10 examples, all males, July 24, 1873.
Five years	65	52	200	16	A mean of 5 examples, all males, July 24, 1873.
Six years	72	64	280	25	A mean of 3 examples, all males, July 24, 1873.
Eight to twenty years	75–80	70–75	400–500	45–50	An estimate only, calculating on their weight when fat, and early in the season.

I did not permit myself to fall into error by *estimating this matter of weight*, because I early found that the apparent huge bulk of a sealion bull, or fur-seal male, when placed upon the scales, shrank far below my notions. I took a great deal of pains on several occasions, during the killing season of 1872–73, to have a platform scale carted out into the field: then, as the seals were knocked down, and before they were bled, I had them carefully weighed, constructing the above table from the

records thus obtained; also, I made the following classification then (1872), which is still entirely applicable to these seals as they exist now (1890).

CLASSING THE HOLLUSCHICKIE BY AGE.

When the holluschickie are up on land they can be readily separated into their several classes as to age *by the color of their coats and size* when noted, namely, the yearlings, the 2, 3, 4, and 5 year old males. When the yearlings, or the first class, haul out, they are dressed just as they were after they shed their pup coats, and took on their second covering during the previous year, in September and October; now, as they come out in the spring and summer, 1 year old, the males and females *can not be distinguished apart, either by color or size, shape or action;* the yearlings of both sexes have the same steel-gray backs and white stomachs, and are alike in behavior and weight.

Next year these yearling females, which are now trooping out with the youthful males on the hauling grounds, will repair as nubiles to the rookeries; while their male companions will be obliged to come again to this same spot, without them.

SHEDDING THE HAIR—STAGEY SEALS.

About the 15th and 20th of every August they have become perceptibly "stagey," or, in other words, their hair is well under way in shedding. All classes, with the exception of the pups, go through this process, at this time, every year. The process requires about six weeks between the first dropping or falling out of the old over hair and its full substitution by the new. This takes place as a rule between August 1 and September 28.

The fur is shed: but it is so shed that the ability of the seal to take to the water and stay there, and not to be physically chilled or disturbed during the process of molting, is never impaired. The whole surface of these extensive breeding grounds, traversed over by us after the seals had gone, was literally matted with the shed hair and fur. This under fur or pelage is, however, so fine and delicate and so much concealed and shaded by the coarser over hair that a careless eye or a superficial observer might be pardoned in failing to notice the fact of its dropping and renewal.

The yearling cows retain the colors of the old coat in the new when they shed it for the first time, and from that time on, year after year, as they live and grow old. The young 3-year-olds and the older cows look exactly alike, as far as color goes, when they haul up at first and dry off on the rookeries, every June and July.

The yearling males, however, make a radical change when they shed for the first time: they then come out from their "staginess" in a nearly uniform dark gray, and gray and black mixed, and lighter, with dark ocher to whitish, on the upper and under parts, respectively. This coat next year, when they appear as 2-year-olds, shedding for the 3-year-old coat, is of a very much darker gray, and so on to the third, fourth, and fifth season; then after this, with age, they begin to grow more gray and brown, with rufous-ocher and whitish-tipped over hair on the shoulders. Some of the very old bulls change in their declining years to a uniform shade all over of dull-grayish ocher. The full glory and beauty of the seal's mustache is denied to him until he has attained his seventh or eighth year.

CHANGE IN PELAGE.

This change for the worse, or deterioration of the pelage of the male fur seals, takes place, as a rule, in the fifth year of their age. It is

thickest and finest in texture during the third and fourth year of life. Hence, in driving the seals on St. Paul and St. George up from the hauling grounds, the natives made, as far as practicable, a selection from males of that age in 1872–74: they tried hard in 1890 to do so, but could not.

COMPARATIVE SIZE OF FEMALES AND MALES.

The female does not get her full growth and weight until the end of her fourth year, so far as I have observed: but she does most of her growing longitudinally, in the first two. After she has passed her fourth and fifth years, she weighs from 30 to 50 pounds more than she did in the days of her youthful maternity (80 lbs.).

The male does not get his full growth and weight until the close of his seventh year, but realizes most of it, osteologically speaking, by the end of the fifth; and from this it may be, perhaps, truly inferred that the male seals live to an average age of 18 or 20 years, if undisturbed, in a normal condition: and, that the females attain 10 or 12 seasons under the same favorable circumstances. Their respective weights, when fully mature and fat in the spring, will, in regard to the male, strike an average of from 400 to 500 pounds, while the females will show a mean of from 70 to 80 pounds.

GRADATION OF THE FUR OF CALLORHINUS URSINUS.

The gradation of the fur of *Callorhinus ursinus* may, perhaps, be best presented in the following manner:

One-year-old male, well grown at July 1 of every season: Fur fully developed as to uniform length and thickness and evenness of distribution. It is lighter in color and softer in texture than hereafter during the life of the animal. Average weight of skin as removed by the sealers from the carcass 4½ pounds.

Two-year-old male, well grown at June 1 of every season: Fur fully developed as to even length and thickness and uniformity of distribution. It has now attained the darker buff and fawn color, sometimes almost brown, which it retains throughout the life of the animal. It is slightly and perceptibly firmer and stiffer than it was last year, not being at all "fluffy" as in the yearling dress, now. Average weight of skin as taken from the body 5½ pounds.

Three-year-old male, well grown at June 1 of every season: Fur fully developed as to even length, but a shade longer over the shoulders, where the incipient "wig" is forming; otherwise perfectly uniform in thickness and even distribution. This is the very best grade of pelt which the seal affords during its life. Average weight of skin as taken from the body 7 pounds.

Four-year-old male, well grown at June 1 of every season: Fur fully developed as to even length, except a decided advance in length and perceptible stiffness over the shoulders, in the "wig;" otherwise perfectly uniform in thickness and even distribution. This grade is almost as safe to take, and as good as is the 3-year-old. Average weight of skin as removed 12 pounds.

Five-year-old male, well grown at May to June 1 of every season: Fur fully developed, but much longer and decidedly coarser in the "wig" region; otherwise uniform in thickness and distribution. The coarseness of the fur over the shoulders and disproportionate length thereon destroys that uniformity necessary for rating A1 in the market; in fact, it does not pay to take this skin. Average weight 16 pounds.

Six-year-old male, well grown from May to June 1 of every season: Fur fully developed, still longer and stiffer in the "wig" region, with a

slightly thinner distribution over the post-dorsal region, and shorter. This skin is never taken; it is profitless. Average weight 25 pounds.

Seven-year-old and upward male, from May to June 1 of every season: Fur fully developed, but very unevenly distributed, being relatively scant and short over the posterior dorsal region, while it is twice as long and very coarse in the covering to the shoulders especially and the neck and chest. Skins are valueless to the fur trade. Weights 45 to 60 pounds.

This analysis, as above, is a brief epitome of the entire subject: only it should be added that the female skins are as finely furred as are the best grades of the males when pups are not nursing: and also, that age does not cause the quality of their pelage to deteriorate, which it does to so marked an extent in the males. But, taking them into consideration, is entirely out of the question, and ought to be so forever.

The fœtal coat of the pup is composed of coarse black hair alone, the underwool not at all developed. When this is shed and the new coat is put on in September and October, it is furred and haired as a yearling, which I diagnose above. This pelage has, however, no commercial value.

All the skins taken by the company have been prime skins, in the fair sense of the term.

To this diagnosis of 1872–1874 I may add the 4-year-olds are divided by the sealers *into "smooth" 4-year-olds* and *"wigged" 4-year-olds.* The "smooth" skin is the finest one in the field; the "wigged" skin is way below par, and never taken unless fear of not getting the quota for the season, impels the clubbing of them. These young bulls vary remarkably in this matter of being "wigged," or not, at the culmination of their fourth year: just as young men at 18, vary as to having mustaches and beard, or not.

Therefore, since the finest skins are the 3-year and "smooth" 4-year olds, the standard set for killing has been kept steadily at that mark: and, unless a 2-year-old was unusually well grown, it and the yearling male has not been clubbed at all, to speak of, until 1887–88. Then it became absolutely necessary to kill a large portion of these smaller seals, or fail to get the quota of 100,000 annually, since the larger seals were missing (had been killed by the driving and clubbing of the preceding seasons). In 1889, in order to get the quota of 100,000, *more than half the entire catch were "long" and "short"*[1] *2-year-olds;* more *than 25,000 "long" yearlings were taken for the first time in the whole period dating from 1870,* the balance, some 20,000 only, being the prime 3-year and "smooth" 4-year old skins which have hitherto, prior to 1887, been the only ones taken, as a rule.

Among the many bits of evidence as to the rapid elimination of the holluschickie, which I gathered last season (1890), one of the most self-asserting is the following statement of the percentage of rejection which took place on these killing grounds of St. Paul in 1872–1874, contrasted with that which I recorded last summer. The standard for 1872–1874 was 3 and "smooth" 4 year old skins (7-pound and 12-pound pelts); *and it was not lowered.* The standard for 1890, at the outset, was the same until the 4th of July; then, the supply of those skins having practically failed, *the standard was dropped on that day to "long" 2-year-olds* (5½ to 6½ pound skins), and finally on the 18th to the 20th of July, the days of the last killing permitted, *the standard was again dropped so*

[1] A "long" 2-year-old is one that is well grown, or above the average size for that age, i. e., 6-pound skins; a "short" 2-year-old is one that is under grown for its age; i. e., a 5-pound skin. The same classification is applicable and given to the yearlings.

as to take in "short" 2-year-olds and a few "long" yearlings. Yet with all this effort—and the attempt this year to get 60,000 skins was most vigorously made,—only 21,000 skins in round numbers were thus secured,[1] with all possible exertion!

TABLE SHOWING THE REMARKABLE SCARCITY OF KILLABLE FUR SEALS.

Detailed exhibit of percentages of rejection on the killing grounds under the Village: at Zapadnie, and at Stony Point, St. Paul Island.

Date.	Whole number of seals in the driven herd.	Whole number of seals killed.	Percentage of rejection.	Skin standard of acceptance (nothing under).	Where driven from.	Remarks.
1890.			*Per cent.*	*Pounds.*		
June 11	1,200	539	60	7	Reef Crest	Four year and 3 year olds only taken; 12 and 7 pound skins.
18	1,750	470	70	7	Tolstoi, Middle Hill	Do.
23	2,400	518	75	7	do	Do.
24	1,300	426	71	6½	Reef and Zoltoi bluffs	Standard lowered so as to take the "long" 2-year-olds; 6½-pound skins.
25	800	263	70	6½	Polavina and Stony Point	Do.
26	344	97	72	6½	Zapadnie	Do.
27	1,628	392	79	6½	Tolstoi and Middle Hill	Do.
28	1,317	203	85½	6½	Reef Crest	Do.
30	1,262	203	84½	6½	Middle Hill, Tolstoi, and English Bay.	Do.
July 1	1,103	120	90	6½	Northeast Point	Do.
1	2,000	245	89	6½	Reef Crest	Do.
2	1,929	240	88½	6½	Polavina	Do.
3	925	180	81	6½	Zapadnie	Do.
4	4,323	432	90½	5½	Tolstoi, Middle Hill, English Bay, Lukannon, and Ketavie.	Standard again lowered so as take the average 2-year-olds; 5½-pound skins.
7	4,001	350	92	5½	do	Do.
8	1,865	255	87	5½	Polavina	Do.
9	867	162	83½	5½	Zapadnie	Do.
10	3,246	377	89	5½	Reef Crest	Do.
12	5,150	633	88½	5½	Tolstoi, Middle Hill, English Bay, Lukannon, and Ketavie.	Do.
14	1,592	101	93	5½	Reef Crest	Do.
15	4,644	309	93	5½	Tolstoi, Middle Hill, English Bay, Lukannon, and Ketavie.	Do.
17	1,514	172	87	5½	Polavina	Do.
17	1,320	197	85½	5½	Lukannon and Ketavie	Do.
18	1,192	241	79	5½	Zapadnie	Do.

The detailed figures upon which the foregoing tabulation is based, appear in Section VIII, of this report.

In the drive of July 17 from Polavina, above cited, in order to swell the shrinking catch, all the 4-year-old "wigs" in the drive were knocked down. They had been regularly rejected thus far, as they came up daily in the drives. Out of the total of 172 killed in this Polavina drive, 82 were 4-year-old "wigs." Had the standard not been lowered so as to take them the percentage of rejection would have been 95. In the drive of July 18 from Zapadnie, also cited above, all the 4-year-old "wigs" were again taken to swell the diminishing catch; 94 out of the total here of 241, were "wigs." Had they not been taken, 88 per cent of rejection would have been the record of that killing.

On the two last days of killing permitted by the Secretary, viz, July

[1] In the report of the Treasury agent in charge, Mr. Charles J. Goff, for the current year, will be found a detailed daily statement of this work last summer, together with a full and exhaustive tabulation of the work as it has been done during the last twenty years upon these islands. I take much pleasure in reprinting this work of Mr. Goff; it will be found in the Appendix, postea, pp. 219-224.

19 and 20, the standard was again lowered so as to take all the "short" 2-year-olds; and the catch of those last killings was increased more than 70 per cent by the acceptance of 5-pound skins, which had been rejected emphatically up to that hour.

Had the lessees been permitted to kill longer, the result would have been another quick "run to emptyings" by the lapse of three or four more killings. The supply of "short" 2-year-olds would then have been exhausted in turn, as the higher grades had, hitherto. The seals simply do not exist in sufficient numbers to fill the quota, and the above statements of fact prove it.

TABLE SHOWING CONTRAST IN SEASONS OF 1874 AND 1890.

Summary of this percentage of seals rejected from the herds (as driven from the hauling grounds) when upon the killing grounds of St. Paul Island, Pribilov Group, Bering Sea.

[Average percentage of seals "turned out" from the driven "pods."]

Dates of driven herds.	Seasons of 1872–1874, inclusive. *a*	Season of 1890. *b*
	Per cent.	*Per cent.*
From June 5 to 15, inclusive	5 to 8	60 to 70
From June 15 to 30, inclusive	10 to 12	70 to 85
From July 1 to 15, inclusive	35 to 40	*c* 85 to 90
From July 15 to 20, inclusive	60 to 75	*d* 90 to 93

a Nothing but 7 to 12 pound skins taken from the start to the finish.
b Nothing but 7 to 12 pound skins taken up to July 4; then all 5½-pound skins included; last two days, all 5-pound skins were taken.
c Standard lowered to 5½-pound skins.
d Standard again lowered to 5-pound skins.

The foregoing statement declares that in 1872–1874, to get the quota then secured of 100,000 7 and 12 pound skins (3 and 4 year olds chiefly then taken), required the driving of only 126,000 seals from the hauling grounds to the slaughter fields.

But in 1890, if a quota of 100,000 such skins could have been secured, it would have required the driving of at least 1,000,000 seals!

It is, to-day, an extremely liberal estimate of mine when I admit the existence of 80,000 holluschickie, or male seals, from 1 year old to 4-year-olds, as left upon these islands of Pribilov July 31, 1890; and 9 per cent of this 80,000 are yearlings!

The strange absence of a due proportion of 2-year-olds in the assembled holluschickie of this year (1890), I believe is largely due to the killing of some 25,000 yearlings last summer, in that desperate effort made then, to fill out the quota allowed of 100,000, coupled with the subsequent deadly effect of that summer's driving upon the spared yearlings.

The following field notes and data, are now given in this connection:

JUNE 23, 1890.

Those two pods of holluschickie which I have observed under Middle Hill and Tolstoi during the last two days, were driven up this morning. I made an itemized count of percentages—the number driven up in each "pod" and the number turned out to the sea from it.

Pod number.	Driven up.	Number killed.	Pod number.	Driven up.	Number killed.
1 *a*			8	50	15
2	79	9	9	47	7
3	27	7	10	39	9
4	37	8	11	45	6
5	61	15	12	69	9
6	46	10			
7	61	15	Total	561	110

a Not in time to count it.

Eleven pods of 561 animals, and only 110 of them taken, or 80 per cent of the whole number driven, rejected.

This gives a fair average of the whole drive to-day, some 2,800 animals, since 518 skins only were taken.

At this time in 1872, only 10 to 12 per cent of such a drive were turned away: the standard being the same to-day, as it was then. To-day all the seals taken, with the rare example of a few 4-year-olds, were 3-year-olds, not one 4-year-old in twenty, taken, and a remarkable absence of 2-year-olds—a few only.

Those turned away were—95 per cent of them at least were—"long" and "short" yearlings, a few 5-year-olds, and a very few 6-year-old bulls, and a very few "short" 2-year-olds also.

A small pod of holluschickie have just made their appearance, close up under the bluffs at Zoltoi, 100 to 150 of them at about 11 a. m. Now, that calls to my mind this question, Where have those tired seals, driven this morning, and released from the pods into the Lagoon slough and from there direct into the sea—where do they go? Do they haul up again? Yes, everybody says so, and I do not know anything to the contrary, and much in affirmation. Then, that being so, these seals spared to-day may be driven to-morrow from Zoltoi Bluffs, to be spared again and driven next week, and so on all over through the season. What indication, truthful one, have we of what number of fresh holluschickie really arrive from this time forth, if these released seals are to continually present themselves, as they do? So, as matters go, the steady increase daily of discarded seals, together with the fresh or new arrivals, are driven day after day over and over again throughout the killing season.

Then, in 1872–1874, this proportion of rejected or "turned away" seals from all the drives up to the 1st of July was not over 10 or 12 per cent of the whole drove driven; now it is 80 and 90 per cent of this number—yearlings, that do require six years of rest ere they are fit for rookery service. This is the status at the present moment on the killing grounds right in the very height of the best hour for sealing in the whole season; and this, too, must be considered in the light of the positive declaration of the natives that this repeated driving renders the spared males wholly unfit for rookery service—breaks down their nerve.

How many of these released seals this morning have been driven over that road before this season? On the 17th, the last drive prior to this one to-day, from Middle Hill and Tolstoi was made, 70 per cent of that drove was turned away; and now, to-day, the same drive is made over again, after an interval of six days' rest of the ground, and 80 per cent is turned away. I shall observe the next drive very closely as it comes in from Middle Hill and Tolstoi. At this rate of increase of rejection, where will the driving be in July, when the yearlings begin to haul in bodies?

JUNE 24, 1890.

A drive this morning at 5.50 from the Zoltoi bluffs of about 500, all told, and another "pod" from the reef, some 750, coming. Yesterday morning at 7 o'clock, there was not a single holluscheck under Zoltoi bluffs: but, in less than three hours after the killing began on the Lagoon flats, and the turning out there of 80 per cent of all that Middle Hill drive, I observed holluschickie hauling under those bluffs at Zoltoi, and a few on the sands, the first that have hauled there this year. Now, the query enters my mind, Were any of these spared seals of yesterday, hauling up at Zoltoi yesterday? Look at the map and observe the significance of the surroundings. Everybody in 1872, and everybody to-day, admits that these seals which are released from the drives haul up again, are driven over again: released once more, and still driven again and again throughout the season.

In 1872 on this St. Paul village ground a 5-year-old bull was pointed out to me by Chief Booterin, which was marked by some curious pink-white mottles on its dark fore flippers. Booterin said to me that that "polseecatch"[1] had been driven up in this way already, twice from the hauling grounds, and this made its third trip since the season opened. It was not noticed in any of the subsequent drives. It may have gone over to St. George in disgust, or have hauled at Zapadnie, at Southwest Point, Polavina, Tonkie Mees, where at any one of these resorts at that date, it would have remained in peace: for, no seals were then driven from any of these points; or it may have gone to Northeast Point and exhibited itself to Webster and his men; and again, this last drive above noted may have so enfeebled it as to cause its subsequent death at sea.

That these "half bulls" or "polseecatch" thus driven in 1872 should not attempt then to land on the rookeries was not surprising. They simply could not, for the crowds of old and virile bulls stationed there, never let them. But to-day, where there are wide gaps in the water lines and above these breeding bulls, *why is it that these "half bulls," in these drives to-day,* (5 and 6 year olds) *do not ever attempt to go there now, where there is no sign of opposition?* It is remarkable. The statement made by the natives in 1834–35, and to-day, that this driving renders them unfit for breeding, is the only solution.

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[1] "Polseecatch," or half bull; name given by natives to all fur-seal males over 4 and under 7 years of age.

At 7 a. m. I went down to the killing grounds and followed the podding and clubbing of the entire drive as brought up from the Reef crest and Zoltoi bluffs early this morning The Zoltoi pod arrived on the ground long before the Reef pod—two hours sooner. It was made up largely of "polseecatchie" and yearlings—the oldest bulls thus far of the season, 6 and 7 year olds: and in this drive were many bulls which the natives said, as they pointed them out, had come over from the Lagoon killing yesterday; they knew the individuals by certain clubbing marks, etc.

The seals turned aside this morning were exclusively yearlings and "short" 2-year-olds, and a large number of "half bulls." No "long" 2-year-old escaped; so, therefore, many 5¼ and 6 pound skins will appear in this catch. There was, however, a notable absence of 2-year-olds in proportion to the number driven, and the bulk of the catch was 3-year-olds, as was yesterday's killing, with a very large number of 4-year-olds in proportion for the small number of skins secured. A few cows appeared in the drive; two of them were rookery cows, and two or three were what I called "barren females" in 1872–1874. It is impossible, as the driving is now conducted, to avoid getting a few cows in the herd, since nearly two-thirds of that drive this morning came from the breeding lines on the Reef crest. Driving thus from the close proximity of breeding lines was not done in 1872–1874; and then, too, I never saw such an extraordinary number of 6-year-old bulls driven up here, before. True it was that in 1872 great numbers of these vagrants, or whipped bulls, were to be seen on the hauling grounds then: yet the natives could and did "walk them out" at the start, so, very few of them came along in the drive. I have often watched them cut out these large young bulls and any older ones from the drives as they started from English Bay or Lukannon. They don't do it now; they are afraid to lose a single eligible seal.

JUNE 27, 1890.

In 1872–1874 very little attention was paid to driving seals until the 12th or 14th of June. True it was, that bands of thousands of holluschickie were then many days long before that date, hauled out on the several resorts: yet then, because these animals were not in greater numbers, and were nearly all of them down by the surf margin, it was deemed best to wait until the 12th or 14th before beginning in earnest to drive. But, after the 14th of June usually there was such an abundant supply of holluschickie on hand within 1½ miles of this village, and from the salt house at Northeast Point, that no concern was ever given as to the number that they could get—it was the number that they should get (just the other way from the present condition and desire)—for if it was a warmish, dry day in 1872, then only a small drive, so as to get some 1,200 or 1,500 skins, was made. If it was a cool, favorable day, then the driving would be so ordered as to bring in some 2,500 or 3,000 skins, which was about the utmost number that they could handle at the village in those times, per diem, under the most favorable circumstances.

How different now! eighteen years since the above-cited order of affairs on this ground. By the 6th of June the most eager, energetic driving began simultaneously with the arrival of each and every squad of holluschickie, and has been kept up ever since; but up to the 11th of June these drives were nothing better than "food drives," so scant was the supply of killable seals.

JUNE 28, 1890, 5 a. m.

The superb sealing weather still continues. The natives are bringing up a small squad from the Reef (some 1,300) as I write. Not a single seal on the sands of Zoltoi this morning, nor has there been one since the last drive, 24th instant, or any prior to that this season. This is remarkable—most remarkable. This squad of holluschickie driven up from the Crest, when released from the several pods on the killing grounds adjacent to Zoltoi, went directly to the sea over by Gull Hill, then headed back for the Reef Point—a few for Ketavie, and many of the "half bulls" actually hauled out under Gull Hill and Grassy Summit in less than an hour after their release from the driven herd, in which they formed quite a large element this morning.

As these field notes of my daily investigation last summer appear *seriatim* and *in extenso* in Section VIII, following, I will make but one more quotation in this connection illustrative of the utter failure of the supply of killable seals over 1 year old on these islands to-day.

JUNE 30, 1890.

* * * The shameful significance of this day's work can be seen by the most casual observer. I counted over twenty-four "moon-eyed" or blind or semiblind holluschickie as they escaped in the several "zupooskas," all of which have been crippled in this manner this season by the effects of prior driving? How many of these yearlings and "short" 2-year-olds that were released this morning, will again be driven before the season is over? Nearly all of them. They pass from the pods into the sea over the Lagoon bar; they meet squadrons of cows playing and lolling in the water around the rookeries; they pause, listen, and join in the general comfort which the water certainly affords them; and, as the females and fresh arrivals of their own

sex haul out on land, these unfortunate seals are beguiled again very soon, or a few days later, into that deadly procession to that ground from which they were driven early this morning. How the significance—the death of this driving—now keeps rising to my mind. I had little occasion in 1872–1874 to give it thought: and, what I did then was only in a suggestive mood.

I passed up from the killing grounds over to Tolstoi rookery, and gave the seal path or road, a careful review. A few holluschickie were again hauled out under Middle Hill, and a dozen, perhaps, on the Tolstoi rookery sand intersection: but, the great hauling grounds of English Bay are utterly destitute of seal life at the hour of this writing: and have been so ever since the season opened, with the marked exception of those small squads under Middle Hill, in the rear of Neahpahskie Kammen, and the sand beach at the immediate ending of the Tolstoi breeding lines. These microscopic areas are the only points now in all that vast extent of ground over which in 1872–1874 the holluschickie of English Bay spread their heavy squadrons!

Not a holluschickie on Zoltoi sands to-day, and only a handful on the rocks beyond and above, from which the Zoltoi drives, so called, have all been thus far. Mr. Goff assures me that there was no driving from the sands here last year—it was all from these rocks above the Zoltoi bluffs. When this famous hauling ground began to fail was full time for its a note of warning to have been heard. When did it fail?

From the journals of the Treasury agent's office on St. Paul and St. George islands, I have extracted the following data, which declares plainly enough that until the season of 1885 closed, the annual quota of 100,000 prime skins was easily taken on these islands between the 1st and 14th of June and the 20th of July; that in 1885, the work suddenly dropped behind, and continued to lag until the total failure of 1890 closes this sad record:

Table showing dates of the first and last killings of each official sealing season on the Pribilov Islands.

[The season of 1890 closed on the 20th of July by order of the Secretary of the Treasury.]

Year.	Island of St. Paul.		Island of St. George.	
	First killing.	Last killing.	First killing.	Last killing.
1870 *a*	.....	.....	.....	.....
1871	May 16	July 31	June 4	*b* July 31
1872	June 1	*c* July 30	June 3	July 27
1873	....do ...	*d* July 24	June 4	July 28
1874	June 3	*e* July 28	June 1	July 27
1875	June 1	July 22	....do ...	July 17
1876	June 6	July 19	....do ...	July 7
1877	June 4	July 18	June 9	July 10
1878	June 8	....do ...	June 10	July 21
1879	June 2	July 16	June 3	*f* July 16
1880	June 3	July 17	....do ...	July 9
1881	June 6	July 20	June 9	July 16
1882	June 2	....do ...	June 12	*g* July 19
1883	June 4	July 19	June 11	July 31
1884	June 2	July 21	June 4	Aug. 4
1885	June 3	July 27	June 1	July 27
1886	June 2	July 26	June 10	July 23
1887	June 6	July 23	June 9	July 22
1888	June 2	July 27	June 6	July 27
1889	June 5	July 31	June 4	July 29
1890	June 6	July 20	June 2	July 20

a No record. *b* Delayed for "food drives" after 22d.

c The catch of 75,000 was substantially taken on July 17. A few thousand skins left for food driving until 30th.

d The catch of 75,000 was substantially taken by the 20th. A few thousand skins left for food driving until the 24th.

e The catch of 90,000 was substantially taken on the 16th of July; but a few thousand skins for food driving were left over to the 28th.

f This season's work covers the first draft made upon the reserves.

g Heavy draft begun this year upon the reserves.

Official entries in the journal of the chief special agent of the Treasury Department, at St. Paul Island, relative to the close of the sealing seasons on that island since 1879, the year of first hint of diminution: [1]

July 14, 1879.—Drive from Zoltoi, 2,652 skins taken.

July 16, 1879.—Last day of the sealing season. Drive from Middle Hill making up the full quota for this island. The natives round up the sealing with a yell. (H. G. Otis, p. 99.)

[1] See detailed statement in Appendix p. 218.

July 17, 1880.—Drive from Zoltoi, the last drive of the regular season, making up the full quota, 80,000. (H. G. Otis, p. 181.)

July 20, 1881.—Drives from Tolstoi, Zoltoi, Ketavie, and Lukannon, the last of the regular sealing season, 2,530 skins taken, filling the islands' quota of 80,000. (H. G. Otis, p. 231.)

July 20, 1882.—The seals killed to-day fills the quota of 1882; total killed, 81,510. (H. A. Glidden, p. 268.)

July 19, 1883.—This entry closes the sealing season. (H. A. Glidden, p. 305.)

July 21, 1884.—To-day's killing closes the sealing season of 1884; total killed, 88,951. (H. A. Glidden, p. 347.)

July 27, 1885.—The Alaska Commercial Company made a final drive from Zoltoi Reef and Middle Hill, and killed 983, which closes the season's quota, making in all 99,996. (G. R. Tingle, p. 379.)

July 26, 1886.—The Alaska Commercial Company completed the season's killing to-day, securing the full quota for this island, viz, 85,000. (G. R. Tingle, p. 449.)

July 12, 1887.—Alaska Commercial Company killed and salted 4,812 skins.

July 13, 1887.—Alaska Commercial Company killed and salted 4,958 skins. The last two killings are the largest for years in a single day.

July 23, 1887.—Alaska Commercial Company made a drive at Southwest Bay to close the season. (G. R. Tingle, p. 13.)

July 27, 1888.—The sealing season closed to-day, completing the full quota of 100,000, being 85,000 for this and 15,000 for St. George Island. (G. R. Tingle, p. 76.)

July 31, 1889.—The season closed to-day, the full quota being secured for this island (85,000). (C. J. Goff.)

The foregoing statements of fact, declare that the first breakdown from the regular time, July 20, of getting the whole catch since 1870, took place in 1885: then it fell suddenly to the 27th of July: rallied a little in 1887, but fell back again in 1888, and down to the bottom in 1889. This season of 1890 never had a real beginning, if a comparison of the seals, killed daily since it opened, is made with the daily record of any of the preceding twenty years.

The custom on both islands, in driving, of combining the herds from several localities into one drive as it is brought upon the killing grounds, makes a direct comparison, between years, of the catch taken from any one hauling ground, very difficult: indeed, incorrect if attempted.

But there are two localities, Northeast Point of St. Paul and Zapadnie, on St. George Island, where there is no opportunity to merge any other seals driven except those found there alone. This makes the following contrast, between the work of 1889 and 1890, very direct and honest:

Daily record of seals taken at Novastoshah, seasons of 1889–90.

Date.	1889—number of skins.	1890—number of skins.	Skin grade; nothing under. 1889.	Skin grade; nothing under. 1890.	Date.	1889—number of skins.	1890—number of skins.	Skin grade; nothing under. 1889.	Skin grade; nothing under. 1890.
			Pounds.	*Pounds.*				*Pounds.*	*Pounds.*
June 17	1,054	16	6	7	July 6	376	.....	6	5½
18	1,270	78	6	7	7	.....	336	6	5½
19	494	.....	6	7	8	914	378	6	5½
20	.....	438	6	7	9	641	271	6	5½
21	1,205	96	6	7	10	800	112	6	5½
23	.....	176	6	7	13	793	641	6	5½
24	754	202	6	7	15	1,838	245	5	5½
25	1,407	164	6	7	16	1,156	311	5	5½
26	441	.....	6	7	17	948	485	5	5½
27	844	225	6	7	18	1,282	405	5	5½
28	479	79	6	7	19	834	446	5	5
29	355	.....	6	7	20 *a*	243	464	5	5
30	.....	97	6	7					
Total	8,403	1,601	.....	.....	Total	15,076	4,890	.....	.....
July 1	1,200	130	6	7	July 22	350	.....	5	.....
2	968	96	6	7	23	740	.....	5	.....
3	.....	180	6	7	24	610	.....	5	.....
4	1,559	318	6	5½	26	1,433	.....	5	.....
5	1,524	74	6	5½	29	1,625	.....	5	.....
					31	938	.....	5	.....

a Season closed for 1890 by order of the Secretary of the Treasury.

The contrast thus clearly drawn between the work at Northeast Point last year, and this season of 1890, tells its own story. Down on the kill, ing grounds at the village of St. Paul, the general manager, in 1889- became alarmed at the prospect of failure to get the season's quota of 100,000 for both islands. He accordingly lowered, on the 13th of July, the standard from a 6-pound skin to a 4½-pound skin, thus taking in all the "long" yearlings and everything above to the 5-year olds. But Webster, then at Northeast Point, stubbornly refused to kill anything under a "short" 2-year-old or 5-pound skin.

At the village, however, over 20,000 of these "long" yearlings were knocked down, and taken after the 13th of July, 1889. That enabled the shipment of that season's quota of 85,000 skins from St. Paul after the 31st July.

Daily record of seals taken at Zapadnie, St. George Island, seasons of 1889–90, between the 10th of June and 20th of July.

Date.	1889—number of skins.	1890—number of skins.	Skin grade; nothing under.		Date.	1889—number of skins.	1890—number of skins.	Skin grade; nothing under.	
			1889.	1890.				1889.	1890.
			Pounds.	*Pounds.*				*Pounds.*	*Pounds.*
June 10	207	.....	6	7	July 12	192	.....	6	7
17	244	.....	6	7	14	.....	53	6	7
20	.....	394	6	7	15	371	.....	6	7
24	595	.....	6	7	18	439	.....	6	7
27	223	189	6	7	20	.....	527	6	5
Total	1,269	583	.....	.....	Total	1,498	635	.....	.....
July 1	167	.....	6	7	July 22	500	.....	6	.....
7	.....	58	6	7	25	279	.....	6	.....
8	229	.....	6	7	28	568	.....	6	.....

The following are extracts from the journal of the Treasury agent, St. Paul Island, showing the dates of the first regular drafts made upon the reserved male life at Zapadnie (Southwest Bay) and Polavina.[1] These dates also declare the time of that exhaustion in part, of the regular sources of hitherto abundant supply at Tolstoi, Middle Hill, Lukannon, and Zoltoi:

June 9, 1879.—Antone Meloviedov started with a gang to make a drive at Halfway Point. (P. 92.)

June 10, 1879.—The drive to-day (at Polavina) resulted in the taking of 1,118 skins. (H. G. Otis, p. 93.)

June 11, 1879.—Drive made from Southwest Bay (Zapadnie) to-day and 1,462 skins taken. (H. G. Otis, p. 93.)

In this connection I am able to say that I personally observed, in 1872, the origin and progress of every St. Paul Island drive made up to the village killing grounds; and again, Lieutenant Maynard and myself followed the record of every drive made on both islands during the killing season of 1874. "Middle Hill" had no name—was not known to the whites as such in those days. Everything then westward beyond it, Tolstoi and English Bay hauling grounds, beginning at "Nearhpahskie Kammen," or "hair-seal rocks," was called "Zapadnie" by both whites and natives when alluding to that region. The "English Bay" drives were all made from someways beyond the breeding Tolstoi seals, where the holluschickie hauled out on what is now generally recognized as the "Middle Hill" grounds.

From this day on to the close of that sealing season's work, July 20, Zapadnie was driven often, and Polavina also. But in 1880 only one

[1] See detailed statement, Appendix, p. 195-197.

drive was made from this reservoir at Zapadnie, that on the 7th of June, in which 1,496 skins were taken. And again in 1881 it was not driven from at all: but ten drives that year were made from the Polavina reserve, beginning on the 10th of June, in which 474 skins were taken.[1]

But, in 1882 the draft began in earnest; and it has never ceased up to the end of the present season of 1890.

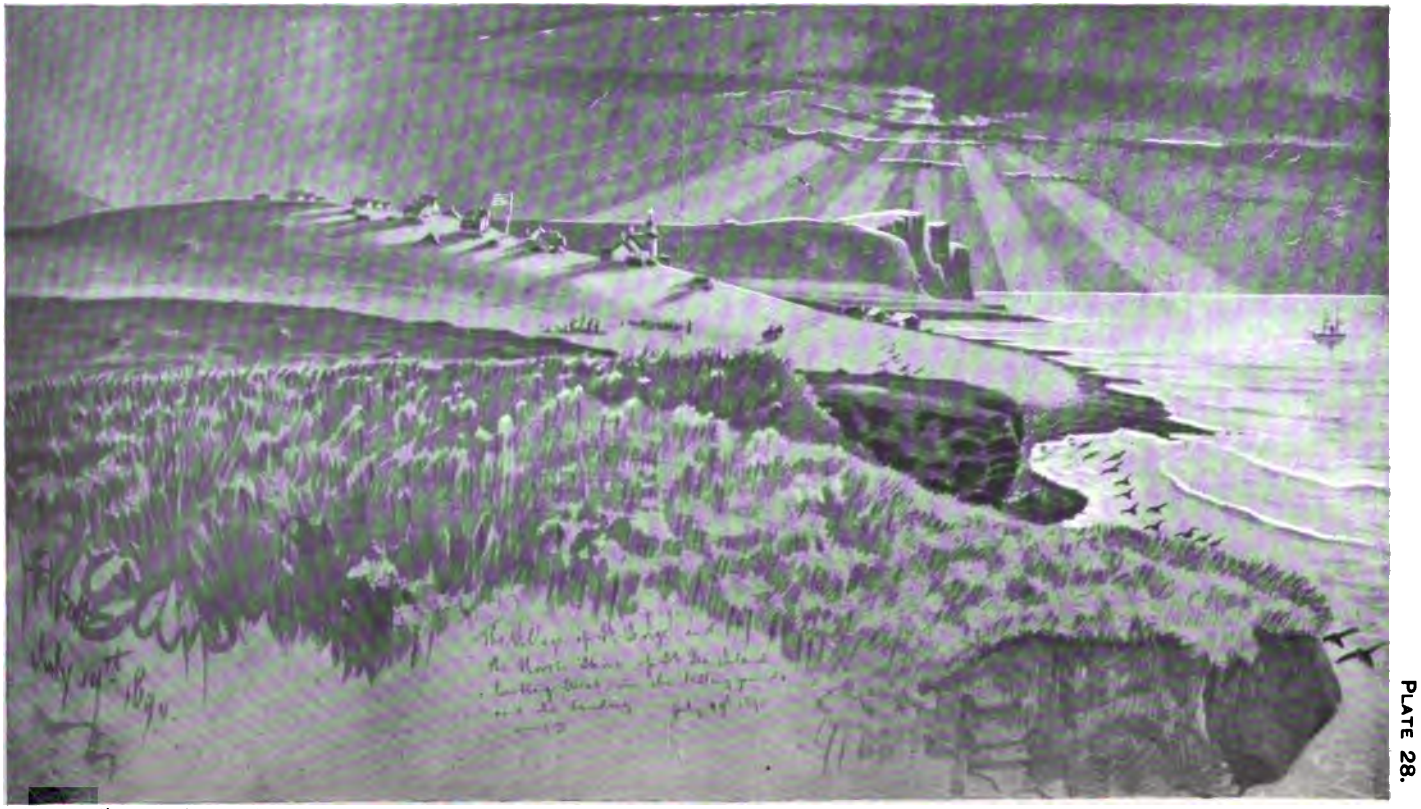
The work of rapid depletion of the seal life on the hauling grounds of the Pribilov Islands takes its origin at the beginning of this season of 1882. The following citations from the Treasury agent's journal on St. Paul Island show the suddenness, the regularity, and the frequency of these heavy drafts of 1882 upon that surplus male life which was wholly undisturbed by man in 1872–1874.

June 2, 7, and 12, 1882, drives made from Southwest Bay, etc. June 13, 1882, drive made from Polavina, etc. June 17 and 20, 1882, drives made from Southwest Bay, etc. June 23, 1882, drive made from Polavina, etc. June 26 and 27, 1882, drives made from Southwest Bay, etc. June 30, 1882, drive made from Polavina, etc. July 3, 1882, drive made from Southwest Bay, etc. July 8, 1882, drive made from Polavina, etc. July 13 and 20, 1882, drives made from Southwest Bay, etc.

Season closed on the 20th; the full quota then taken of 85,000 for St. Paul.

And another feature of this draft is that the skins taken from these reserves were all large skins—*nothing under 3 and 4 year olds*, or 7½ to 12 pound skins, until the end was reached in 1889, by the 31st of July.

[1] See detailed statement, Appendix, p. 217, 218.



A drawing from nature by the author.

THE NORTH SHORE AND THE VILLAGE, SAINT GEORGE ISLAND, JULY 19, 1890.

View looking west, over the killing grounds, the village hill, to the High Bluffs and Dainoi Mees; the anchorage of the vessels, and the landing, salt houses on the beach, etc.

PLATE 28.

SECTION V.

CHARACTER, CONDITION, AND NUMBER OF NATIVES OF THE PRIBILOV ISLANDS IN 1872, 1874, AND 1890.

WHAT CONSTITUTES A NATIVE.

There has been some divergence of opinion on the islands as to who are the real "natives" thereof, because these natives enjoy certain privileges that are very valuable to them, and coveted by all outside Alaskan brethren.

In this connection, the people, living here, are divided into three classes—that is, the males:

First. The natives, properly speaking, or those who have been born and raised upon the Pribilov Islands. Not over one-tenth of the present adult population can lay claim to this title.

Second. The people who were living thereon, but not born natives at the time of the transfer of all Alaska, July, 1867. This class constitutes a majority of the citizens of the two islands as they exist to-day.

Third. The people who were living and working as sealers on the Pribilov Islands at the date of the granting by the Government of the present lease to the Alaska Commercial Company, August 3, 1870.

Of the above three divisions, strict justice and true equity unite in recognizing the third class as the "natives" of the Pribilov Islands. This settles the question also to the best satisfaction of these people themselves, and removes every quibble of dispute in the premises. Accurate records of the men, women, and children living on each island at the date of the lease in 1870, can be found in the church registers on both St. Paul and St. George.

According to Bishop Veniaminov, the inhabitants of the Pribilov Islands belonged to the parish of Oonalaska, the priest of which was obliged to visit them once every two years (to marry, baptize, etc.). These islands were not known before the year 1786. Mate G. Pribilov, then in the service of the Leybedev company, first, in the Russian name, found them: but at the same time he was not the first discoverer, because, as the Bishop says, in his account, (Part I, chapter 1),[1] on one of them (southwest side of St. Paul) signs such as a pipe, brass knife handle, and traces of fire were found, indicating that people had been there before, but not long, as places were observed where the grass had been burned and scorched. But if we can believe the Aleuts in what they relate the islands were known to them long before they were visited by the Russians. They knew and called them "Ateek," after having heard about them.

When Pribilov, in taking possession, landed on St. George a part of his little ship's crew, July, 1786, he knew that, as it was uninhabited, it would be necessary to create a colony there, from which to draft laborers to do the killing, skinning, and curing of the peltries. Therefore he and his associates, and his rivals after him, imported natives

[1] Zapieska ob Ostrovah Oonalashkenskaho Otdayla, St. Petersburgh, 1842, Pt. I, chap. 1.

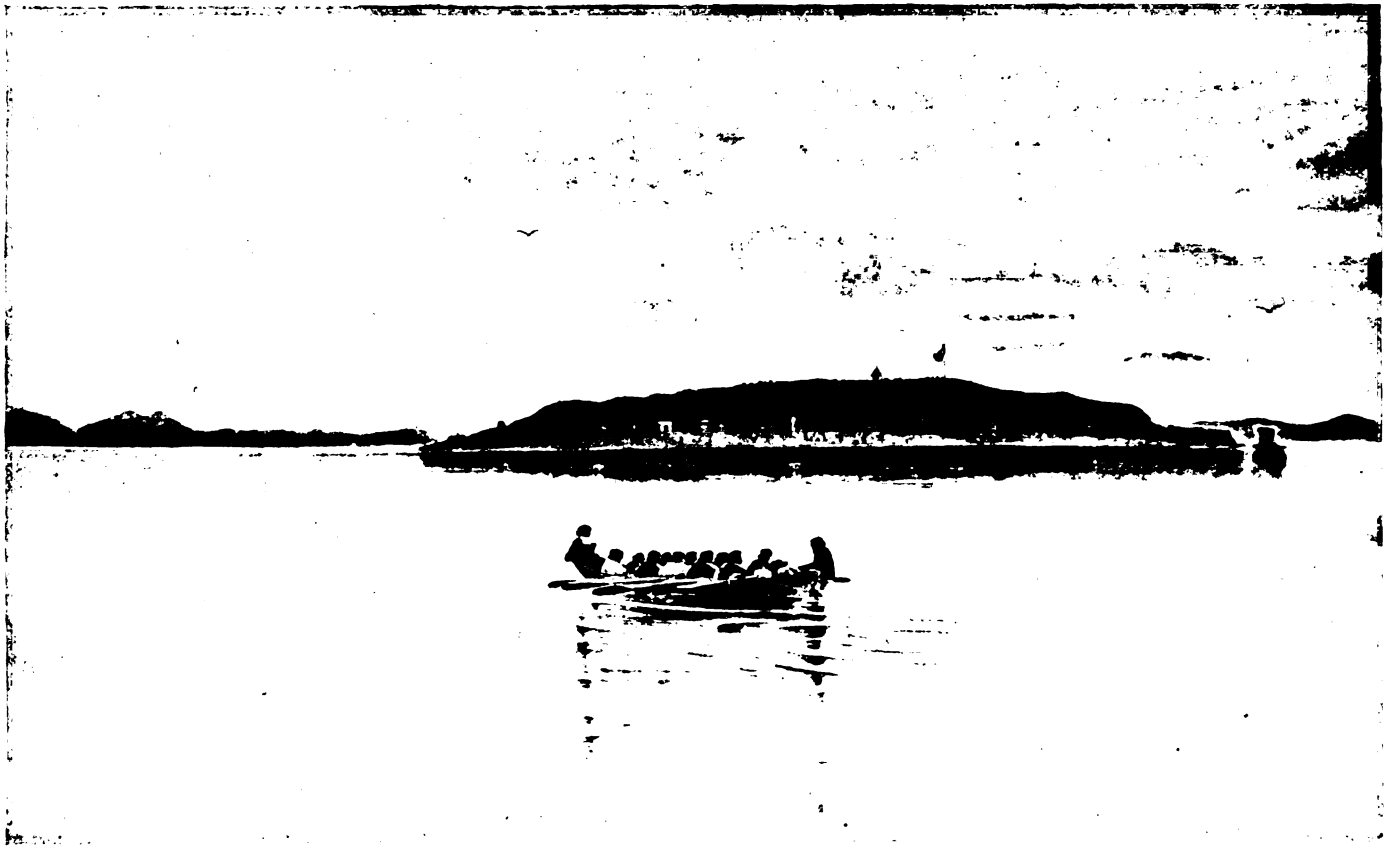
of Oonalaska and Atkha—passive, docile Aleuts. They founded their first village a quarter of a mile to the eastward of one of the principal rookeries on St. George, now called Starry Arteel, or Old Settlement. A village was also located at Zapadnie, and a succession of barraboras planted at Garden Cove. Then, during the following season, more men were brought up from Atkha and taken over to St. Paul, where five or six rival traders posted themselves on the north shore near and at Maroonitch, and at the head of the Big Lake, among the sand dunes there.

They were then, as they are now, somewhat given to riotous living if they only had the chance: and the ruins of the Big Lake settlement are pleasantly remembered by the descendants of those pioneers to-day on St. Paul, who take off their hats as they pass by, to affectionately salute and call the place "Vesolia Mista," or "Jolly Spot." The elder men told me, with great unction, that "in those good old days they had plenty of rum." But, when the pressure of competition became great, another village was located at Polavina, and still another at Zapadnie, until the activity and unscrupulous energy of all these rival settlements well-nigh drove out and eliminated the seals in 1796. Three years later, the whole territory of Alaska passed into the hands of the absolute power vested in the Russian-American Company. These islands were in the bill of sale, and early in 1799 the competing traders were turned off neck and heels from them, and the Pribilov group passed under the control of a single man—the iron-willed Baranov. The people on St. Paul were then all drawn together, for economy and warmth, into a single settlement at Polavina. Their life in those days must have been miserable. They were mere slaves, without the slightest redress from any insolence or injury which their masters might see fit, in petulance or brutal orgies, to inflict upon them. Here they lived and died, unnoticed and uncared for, in large barracoons half under ground and dirt roofed, cold and filthy. Along toward the beginning or end of 1825, in order that they might reap the advantages of being located best to load and unload ships, the Polavina settlement was removed to the present village site, as indicated on the map, and the natives have lived there ever since.

On St. George, the several scattered villages were abandoned and consolidated at the existing location some years later, but for a different reason. The labor of bringing the seal skins over to Garden Cove, which is the best and surest landing, was so great; and that of carrying them from the north shore to Zapadnie, still greater: so, it was decided to place the consolidated settlement at such a point between them on the north shore that the least trouble and exertion of conveyance would be necessary. A better place, geographically, for the business of gathering the skins and salting them down at St. George, can not be found on that island, but a poorer place for a landing it is difficult to pick out: though in this respect there is not much choice outside of Garden Cove.

The Aleutian stock on the islands, as it appears to day, has been so mixed up with Russian, American, and Kamschadale blood, that it presents characteristics, in one way or another, of all the various races of men, from the negro up to the Caucasian. The predominant features among them are small, wide-set eyes: broad and high cheek bones, causing the jaw, which is full and square, to often appear peaked; coarse, straight black hair: small, neatly shaped feet and hands, together with brownish-yellow complexion. The men will average in stature 5 feet 4 or 5 inches: the women less in proportion, although there are exceptions to this rule among them, some being over 6 feet in height

PLATE 29.



A drawing from nature by the author.

POLAVINA SOPKA. THE VILLAGE COVE. ZOLTOI BAY.

THE VILLAGE HILL FROM THE STEAMER'S ANCHORAGE OFF THE COVE, SAINT PAUL ISLAND.

Natives and bidarrah lightering the ship's cargo, April 29, 1872. [To-day a steam launch tows these lighters back and forth between the ship and the village landings.]

and others are decidedly dwarfish. The manners and customs of these people to-day possess nothing in themselves of a barbarous or remarkable character aside from that which belongs to an advanced state of semicivilization.

They are exceedingly polite and civil, not only in their business with the agents of the Government and the company on the seal islands, but among themselves; and they visit, the one with the other, freely and pleasantly, the women being great gossips. But, on the whole, their intercourse is subdued, for the simple reason that the topics of conversation are few: and judging from their silent but unconstrained meetings, they seem to have a mutual knowledge, as if by sympathy, as to what may be occupying each other's minds, rendering speech superfluous. It is only when under the influence of beer or strong liquor that they lose their naturally quiet and amiable disposition. They then relapse into low, drunken orgies and loud, brawling noises. Having been so long under the control and influence of the Russians, they have adopted many Slavic customs, such as giving birthday dinners, naming their children, etc. They are remarkably attached to their church, and no other form of religion could be better adapted or have a firmer hold upon the sensibilities of the people. Their inherent chastity and sobriety can not be commended. They have long since thrown away the uncouth garments of the Russian rule—the shaggy dogskin caps, with coats half seal and half sealion—for a complete outfit, *cap-á-pie*, such as our own people buy in any furnishing house: the same boots, socks, underclothing, and clothing, with ulsters and ulsterettes. But the violence of the wind prevents their selecting the hats of our *haut ton* and sporting fraternity. As for the women, they, too, have kept pace and even advanced to the level of the men, for in these lower races there is much more vanity displayed by the masculine element than the feminine, according to my observation. In other words, I have noticed a greater desire among the young men than among the young women, of savage and semicivilized people, to be gayly dressed and to look fine.

But the visits of the wives of our Treasury officials and the company's agents to these islands during the last twenty years, bringing with them a full outfit, as ladies always do, of everything under the sun that women want to wear, has given the native female mind an undue expansion up there, and stimulated it to unwonted activity. They watch the cut of the garments and borrow the patterns: and some of them are very expert dressmakers to-day. When the Russians controlled affairs the women were the hewers of the driftwood and the drawers of the water. At St. Paul there was no well of drinking fluid about the village, nor within half a mile of the village; there was no drinking water unless it was caught in cisterns, and the cistern water, owing to the particles of seal-fat soot which fall upon the roofs of the houses, is rendered undrinkable; so that the supply for the town, until quite recently, used to be carried by the women from two little lakes at the head of the Lagoon, a mile and a half, as the crow flies, from the village, and right under Telegraph Hill. This is quite a journey: and when it is remembered that they drink so much tea, and that water has to go with it, some idea of the labor of the old and young females can be derived from an inspection of the map. Latterly, within the last fourteen years, the company opened a spring, less than half a mile from the "gorode," which they have plumbed and regulated, so that it supplies them with water now, and renders the labor next to nothing, compared with the former difficulty. But to-day, when water is wanted in the Aleutian

houses at St. Paul, the man often has to get it. He trudges out with a little wooden firkin or tub on his back, and brings it to the house.

The fact that among all the savage races found on the northwest coast by Christian pioneers and teachers, the Aleutians are the only practical converts to Christianity, goes far, in my opinion, to set them apart as very differently constituted in mind and disposition from our Indians and our Eskimos of Alaska. To the latter, however, they seem to be intimately allied, though they do not mingle in the slightest degree. They adopted the Christain faith with very little opposition, readily exchanging their barbarous customs and wild superstitions for the rites of the Greek Catholic Church and its more refined myths and legends.

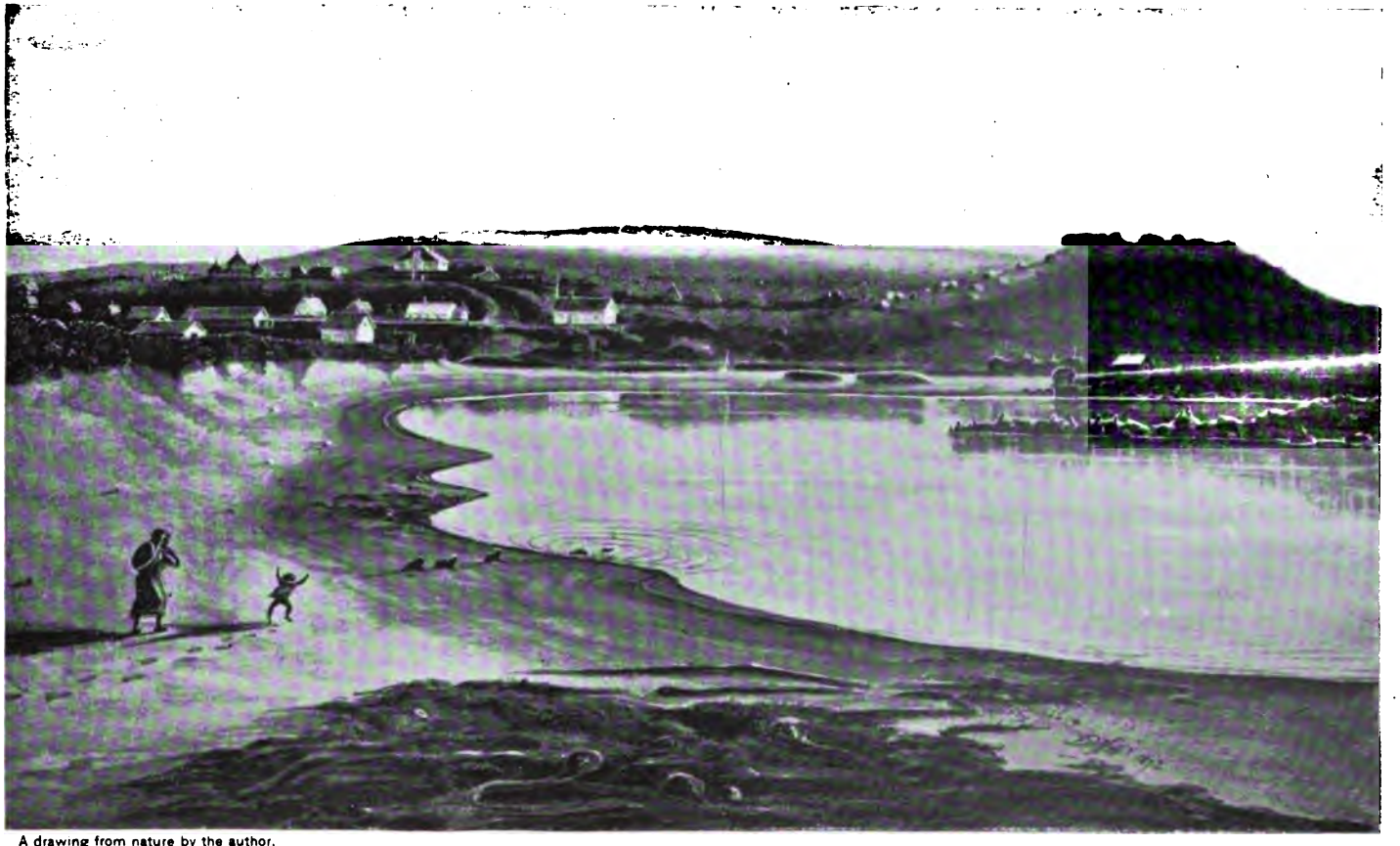
At the time of their first discovery they were living as savages in every sense of the word, bold and hardy, throughout the Aleutian chain: but, now they respond on these islands to all outward signs of Christianity as sincerely as our own church-going people.

Up to the time of the transfer of the territory and leasing of the islands to the Alaska Commercial Company, in August, 1870, these native inhabitants all lived in huts or sod-walled and dirt-roofed houses, called "barrabkies," partly under ground. Most of these huts were damp, dark, and exceedingly filthy. It seemed to be the policy of the short-sighted Russian management to keep them so, and to treat the natives not near so well as they treated the few hogs and dogs which they brought up there for food and for company. The use of seal fat for fuel caused the deposit upon everything within doors, of a thick coat of greasy, black soot, strongly impregnated with a damp, moldy, and indescribably offensive odor. They found along the north shore of St. Paul and at Northeast Point occasional scattered pieces of driftwood, which they used, carefully soaked anew in water if it had dried out, split into little fragments, and, trussing the blubber with it when making their fires, the combination gave rise to a roaring, spluttering blaze. If this driftwood failed them at any time when winter came round, they were obliged to huddle together beneath skins in their cold huts, and live or die, as the case might be. But the situation to-day has changed marvelously.

When Congress granted to the Alaska Commercial Company of San Francisco the exclusive right of taking a certain number of fur seals every year for a period of twenty years on these islands, it did so with several reservations and conditions, which were confided in their detail to the Secretary of the Treasury. This officer and the president of the Alaska Commercial Company agreed upon a code of regulations which should govern their joint action in regard to the natives. It was a simple agreement that these people should have a certain amount of dried salmon furnished them for food every year: a certain amount of fuel: a schoolhouse, and the right to go to and come from the islands as they chose; and also the right to work or not, understanding that in case they did not work, their places would and could be supplied by other people who would work.

The company, however, went far beyond this exaction of the Government. It added an inexpressible boon of comfort, in the formation of those dwellings now occupied by the natives, which was neither expressed nor thought of at the time of the granting of the lease. An enlightened business policy suggested to the company that it would be much better for the natives, and much better for the company too, if these people were taken out of their filthy, unwholesome hovels, put into habitable dwellings, and taught to live cleanly, for the simple reason

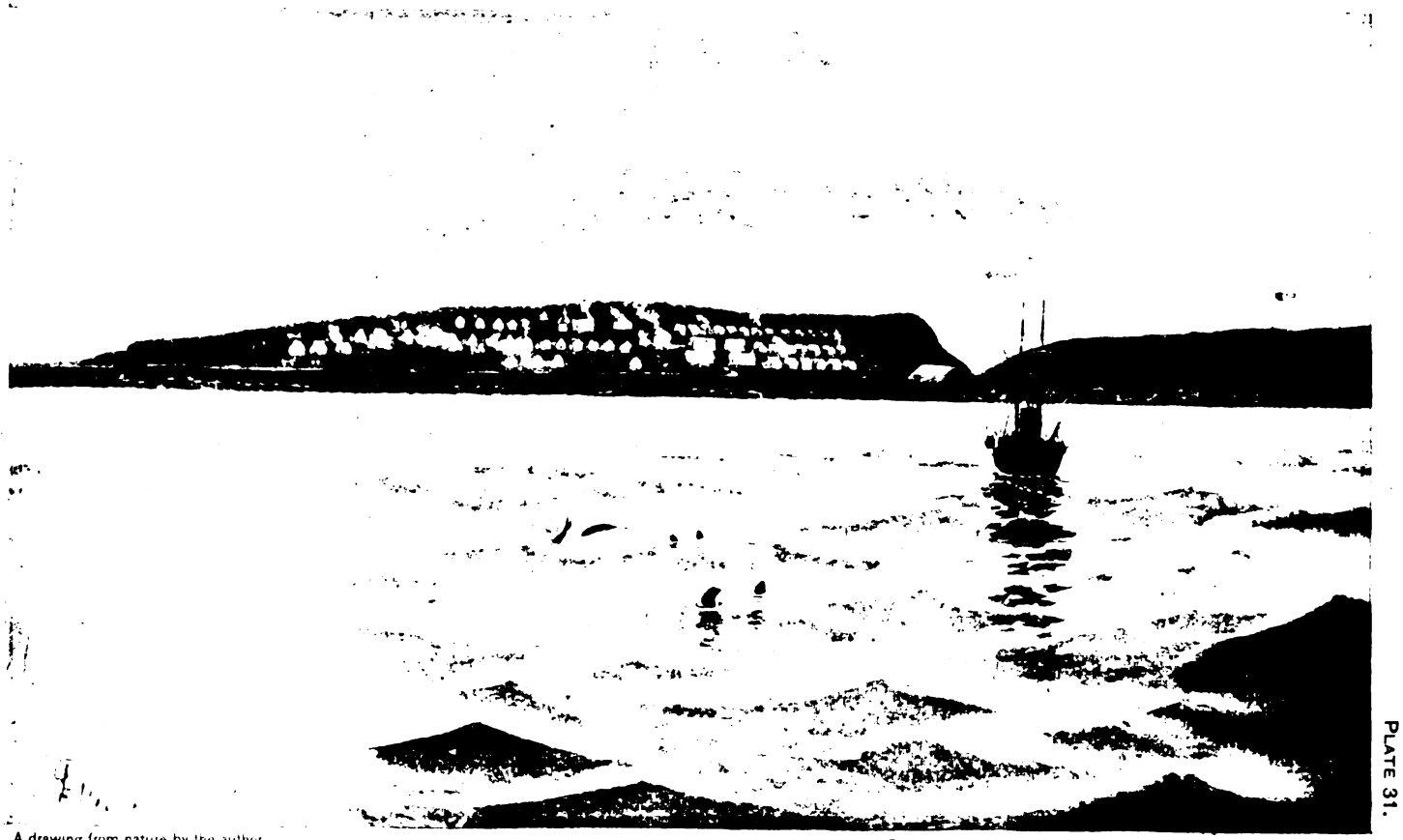
PLATE 30.



A drawing from nature by the author.

THE VILLAGE COVE AND LANDING. SAINT PAUL ISLAND, OCTOBER 22, 1872.

The Treasury agent's house on the hill just finished; the old Russian church, salt houses, store, etc., the barrabkies of the natives not replaced by the frame dwellings to any extent at this date.



A drawing from nature by the author.

THE VILLAGE OF SAINT PAUL, SAINT PAUL ISLAND, AUGUST 9, 1890.

Viewed from the anchorage at the east landing.

PLATE 31.

that by so doing, the natives, living in this improved condition, would be able physically and mentally, every season when the sealing work began, to come out from their long inanition and go to work at once with vigor and energetic persistency. The sequel proved the wisdom of the company.[1]

Many experiments, however, were made and a dozen houses built ere the result was as good as the style of primitive housing, when it had been well done and kept in best possible repair. In such a damp climate, naturally, a strong moldy smell pervades all inclosed rooms which are not thoroughly heated and daily dried by fires; and in the spring and fall frost works through and drips and trickles like rain adown the walls. The present frame houses occupied by the natives owe their dryness, warmth, and protection from the piercing "boorgas," to the liberal use of stout tarred paper in the lining. The overpowering mustiness of the hallways, outhouses, and, in fact, every roofed-in spot where a stove is not regularly used, even in the best-built residences, is one of the first disagreeable sensations which the new arrivals always experience when they take up their quarters here. Perhaps if it were not for the nasal misery that floats in from the killing grounds to the novice, this musty, moldy state of things up here would be far more acute as an annoyance than it is now. The greater grief seems to soon fully absorb the lesser one; at least in my own case I can affirm that result.

We see here now at St. Paul and on St. George, in the place of the squalid, filthy habitations of the immediate past, two villages, neat, warm, and contented. Each family lives in a snug frame dwelling. Every house is lined with tarred paper, painted, furnished with a stove, with outhouses, etc., complete; streets are laid out, and the foundations of these habitations regularly platted thereon. There is a large church at St. Paul and a less pretentious but very creditable structure of the same character on St. George. A pharmacy on St. Paul, with a full and complete stock of drugs, and skilled physicians on both islands to take care of the people free of cost. There is a schoolhouse on each island, in which teachers have been paid by the company eight months of every year to instruct the youth, while the Russian Church is sustained entirely by the pious contributions of the natives themselves on these two islands, and sustained well by each. There are 63 family houses on St. Paul in the village, with 20 or 24 such houses to as many families on St. George, and 18 other structures. The large warehouses and salt sheds, built by the Alaska Commercial Company's skillful mechanics, as have been the dwellings just referred to, are also neatly painted, and, taken in combination with the other features, constitute a picture fully equal to the average presentation of any one of our small eastern towns. There is no misery, no downcast, dejected, suffering

[1] Before this action on their part it was physically impossible for the inhabitants of St. Paul or St. George islands to take the lawful quota of 100,000 seal skins annually in less than three or four working months. They can take them in less than thirty working days now with the same number of men. What is the gain? Simply this, and it is everything: The fur-seal skin, from the 14th of June, when it first arrives, as a rule, up to the 20th of July, is in prime condition. From that latter date until the middle of October it deteriorates, to slowly appreciate again in value as it sheds and renews its coat; so much so, that it is practically damaged in the markets of the world. Hence the catch taken by the Alaska Commercial Company every year was a prime one, first to last; there were no low-grade or "stagey" skins in it. Under the old regimen three-fourths of the skins were taken in August, in September, and even in October, and many such were not worth their transportation to London. Comment on this is unnecessary. It is the contrast made between a prescient business policy and one that was as shiftless and improvident as language can well devise.

humanity here to-day. These Aleuts, who have enjoyed as the price of their good behavior the sole right to take and skin seals for the company, to the exclusion of all other people, are known to and by their less fortunate neighbors elsewhere in Alaska as the "bogatskie Aloutov," or the "rich Aleuts." The example of many of the agents of the Alaska Commercial Company on both islands, from the beginning of its lease, and the course of some of the Treasury agents during the last twenty years have been silent but powerful promoters of the welfare of these people. They have maintained perfect order. They have directed neatness and cleanliness, and stimulated industry such as those natives had never before dreamed of, and have enforced sobriety.

The agents of the Government and the company found so much difficulty at first in getting the youth of the villages to attend their schools, taught by our own people, especially brought up there and hired by the company, that they adopted the plan of bringing one or two of the brightest boys down every year and putting them into our schools, so that they might grow up here and be educated in order to return and serve as teachers there. This policy is warranted by the success attending the experiment made at the time when I was up there first, whereby a son of the chief was carried down and over to Rutland, Vt., for his education, remained there four years, and then returned and took charge of the school on St. Paul, which he served (until his death) with the happiests results in increased attendance and attention from the children. But, of course, so long as the Russian Church service is conducted in the Russian language we will find on the islands more Russian-speaking people than our own. The nonattendance at school was not and is not to be ascribed to indisposition on the part of the children and parents. One of the oldest and most intelligent of the natives told me, explanatory of their feeling and consequent action, that he did not nor did his neighbors have any objection to the attendance of their children on our English school; but if their boys and young men neglected their Russian lessons, he knew not who were going to take their places when they died in his church, at the christenings, and at their burial. To anyone familiar with the teachings of the Greek-Catholic faith, the objection of old Philip Volkov seems reasonable. I hope, therefore, that in the course of time the Russian Church service may be voiced in English; not that I want to substitute any other religion for it—far from it. In my opinion it is the best one we could have for these people; but until this substitution of our language for the Russian is made, no very satisfactory work, in my opinion, will be accomplished in the way of an English education on the seal islands.

As they are living to-day up there, there is no restraint, such as the presence of policemen, courts of justice, fines, etc., which we employ for the suppression of disorder and maintenance of the law in our own land. They understand that if it is necessary to make them law abiding, and to punish crime, that such officers will be among them; and hence, perhaps, is due the fact that from the time that the Alaska Commercial Company's lease was made, in 1870, there has not been one single occasion where the simplest functions of a justice of the peace would or need have been called in to settle any difficulty. This speaks eloquently for their docile nature and their amiable disposition. Surprise has often been genuine among those who inquire over the fact that there is no law officer here at either village, and wonder is expressed why such provision is not made by the Government. But, when the following facts relative to this subject are understood, it is at once clear that a justice of the peace and his constabulary would be entirely useless, if

PENCIL SKETCHES OF THE SEAL ISLAND NATIVES ON SAINT PAUL ISLAND, 1872.

[Made by the author December, 1872.]

Typical Aleut faces: 1. Luka Mandriggan, 49 years; 2. Paraskeeva, girl, 13 years; 3. Ivan, boy, 7 years; 4. Natalia, girl, 12 years; 5. Domian, boy, 12 years. Typical Creole faces: 6. Aggie Kooshlug, boy, 18 years; 7. Feyronia, girl, 9 years; 8. Matroona, girl, 15 years; 9. Philip Vollkov, 50 years; 10. Anourka, girl, 11 years; 11. Dimitrie Veatkin, 48 years.

established on the seal islands. As these natives live here, they live as a single family in each settlement, having one common purpose in life, and only one. What one native does, eats, wears, or says is known at once to all the others, just as whatsoever any member of our household may do, will soon be known to all of us who belong to its organization. Hence, if they steal or quarrel among themselves, they keep the matter wholly to themselves, and settle it to their own satisfaction. Were there rival villages on the islands and diverse people and employment, then the case would be reversed, and need of legal machinery apparent.

As it is, the agent of the Treasury Department is clothed with all the power necessary to fully maintain order up here. He is recognized and respected as the trusted representative of the Secretary of the Treasury, who is the supreme temporal ruler of their little commonwealth: and, as such, he is never disobeyed.

Seal meat is their staple food, and in the village of St. Paul they consume on an average fully 500 pounds a day the year round.[1] They have been, by the permission of the Secretary of the Treasury, allowed every fall to kill 5,000 or 6,000 seal pups, or an average of 22 to 30 young kotickie for each man, woman, and child in the settlements. The pups will dress 10 pounds each. But that is now prohibited. This shows an average consumption of nearly 600 pounds of seal meat by each person, large and small, during the year. To this diet the natives add a great deal of butter and many sweet crackers. They are passionately fond of butter—no epicure at home or butter taster in Goshen knows or appreciates that article better than these people do. If they could get all that they desire they would consume 1,000 pounds of butter and 500 pounds of sweet crackers every week, and indefinite quantities of sugar—the sweetest of all sweet teeth are found in the jaw of the average Aleut. But it is, of course, unwise to allow them full swing in this matter, for they would turn their barrels into fermenting tanks, if they had full access to an unlimited supply of saccharine food. If unable to get sweet crackers, they will eat about 300 pounds of hard or pilot bread every week, and in addition to this nearly 700 pounds of flour at the same time. Of tobacco they are allowed 50 pounds a week; candles, 75 pounds; rice, 50 pounds. They burn, strange as it may seem, kerosene oil here to the exclusion of the seal fat, which literally overruns the island. They ignite and consume over 600 gallons of kerosene oil a year in the village of St. Paul alone. They do not fancy vinegar very much; perhaps 50 gallons a year is used up here. Mustard and pepper are sparingly used, 1 to 1½ pounds a week for the whole village. Beans they peremptorily reject; for some reason or other they can not be induced to use them.

Those who go about the vessels contract a taste for split-pea soup, and a few of these peas are sold in the village store. Salt meat, beef, or pork they will take reluctantly, if it is given to and pressed upon them: but, they will never buy it. I remember in this connection seeing 2 barrels of prime salt pork and a barrel of prime mess salt beef opened in the company's store shortly after my arrival in 1872, and, though the people of the village were invited to help themselves, I think I am right in saying that the barrels were not emptied when I left the island in 1873. They use a very little coffee during the year, not more than 100 pounds; but of tea, *a great deal*, about 100 chests every year; I can say truly, that they do not drink less than a gallon of tea apiece per diem. The amount of this beverage which they sip, from the time they rise in

[1] This estimate was based on a population of 235 men, women, and children, in 1874, at St. Paul. To-day, there are only 213 souls in this village, July 31, 1890.

the morning until they go to bed late at night, is astounding. Their "samovars," and latterly the regular tea kettles of our American make, are bubbling and boiling from the moment the housewife stirs herself at daybreak until the fire goes out when they sleep. It should be stated in this connection that they are supplied with a regular allowance of coal every year by the company gratis: each family being entitled to a certain amount, which, alone, if economically used, keeps them warm all winter in their new houses; but, for those who are extravagant and are itching to spend their extra wages, an extra supply is always kept in the storehouses of the company for sale. Their appreciation of and desire to possess all the canned fruit that is landed from the steamer is marked to a great degree. If they had the opportunity I doubt whether a single family on that island to-day would hesitate to bankrupt itself in purchasing this commodity. Potatoes they sometimes demand, as well as onions: and, perhaps if these vegetables could be brought here and kept to an advantage, the people would soon become very fond of them. Six or seven years ago, and after the supply of sugar had been cut off from their purchase at the store, on account of their abuse of it in making quass and getting frequently drunk, they developed a great fondness for canned milk, ordered it at all times, and never got enough of it. Soon the reason appeared; there was and is a good body in 2 cans of Borden's condensed milk for the making of several gallons of beer!

Most of these articles of food just mentioned are purchased by the natives in the company's store[1] at either island. This food and the wearing apparel, crockery, etc., which the company bring up here for the use of the people, was sold to them at the exact cost price of the same plus the expenses of transportation, and many times within my knowledge they have bought goods here at these stores at less rates than they would have been subjected to in San Francisco. The object of the company was not, under any circumstances, to make a single cent of profit out of the sale of these goods to the natives; they aimed only to clear the cost, and no more. Instructions to this effect were given to its agents, while those of the Government were called upon to take notice of the fact.

Another important factor to the physical well-being of these people, is the presence on the Pribilov Islands of an abundant number of big sea lions (*Eumetopias stelleri*). This animal supplies them with its hide, mustaches, flesh, fat, sinews, and intestines, which they make up into as many necessary garments, dishes, etc. They have abundant reason to treasure its skin highly, for it is the covering to their neat bidarkies and bidarrahs, the former being the small kyak of Bering Sea, while the latter is a boat of all work, exploration, and transportation. These skins are unhaired by sweating in a pile: then they are deftly sewed and carefully stretched while green, over a light keel and frame of wood, making a perfectly water-tight boat that will stand, uninjured, the softening influence of water for a day or two at a time, if properly air dried and oiled. After being used during the day these skin boats are always drawn out on the beach, turned bottomside up, and air

[1]The store at St. Paul, as well as that at St. George, has its regular annual "opening" after the arrival of the steamer in the spring, to which the natives seem to pay absorbed attention. They crowd the buildings day and night, eagerly looking for all the novelties in food and apparel. These slouchy men and shawl-hooded women who pack the area before the counters here, seem to feel as deep an interest in the process of shopping as the most enthusiastic votaries of that business do in our own streets. It certainly seems to give them the greatest satisfaction of their lives on the Pribilov Islands.

A drawing from nature by the author.

A GROUP OF SEA LIONS (*Eumetopias stelleri*), SAINT GEORGE ISLAND, AUGUST, 1890.

Old bulls 11 feet long, average weight 1,200 pounds; adult females 8 feet long, weight 450 to 600 pounds. The common black sea lion of San Francisco, *Zalophus*, is not half so large; is never seen in Bering Sea, but a few of these animals are always in sight, mixed in with the *Zalophus* at San Francisco, as they rest on the Seal Rocks at the Cliff House.

dried during the night. In this way they are made ready for employment again on the morrow.

A peculiar value is attached to the intestines of the sea lion, which, after cleansing, are distended with air and allowed to dry in that shape. Then they are cut into ribbons and sewed strongly together into that most characteristic water-proof garment of the Aleutian world, known as the "kamlaika,"[1] which, while being fully as water proof as india rubber, has far greater strength, and is never affected by grease and oil. It is also translucent in its fitting over dark clothes. The sea lions' throats are served in a similar manner: and, when cured, are made into boot tops, which are in turn soled by the tough skin that composes the palms of this animal's fore flippers. Around the natives' houses on St. Paul and St. George constantly appear curious objects which, to the unaccustomed eye, resemble overgrown gourds or enormous calabashes with attenuated necks. An examination proves them to be the dried, distended stomach walls of the sea lion filled with its oil (and sometimes with dried meat), which, unlike the offensive blubber of the fur seal, boils out clear and inodorous from its fat.

The flesh of an old sea lion, while not very palatable, is tasteless and dry; but the meat of a yearling is very much like veal, and when properly cooked I think it is just as good; but the superiority of the sea-lion meat over that of the fur seal is decidedly marked. It requires some skill in the cuisine ere sausage and steaks of the *Callorhinus* are accepted on the table: while it does not, however, require much art, experience, or patience for the cook to serve up the juicy ribs of a young sea lion so that the most fastidious palate will fail to relish it.

The carcass of the sea lion, after it is stripped of its hide and disemboweled, is hung up in cool weather by its hind flippers over a rude wooden frame, or "labaas," as the natives call it; where, together with many more bodies of fur seals treated in the same manner, it serves from November until the following season of May, as the meat house of the Aleut on St. Paul and St. George. Exposed in this manner to the open weather, the natives keep their seal meat almost any length of time in winter for use; and, like our old duck and bird hunters, they say they prefer to have the meat tainted rather than fresh, declaring that it is most tender and toothsome when decidedly "loud."

In 1872, when slowly sketching by measurements the outlines of a fine adult bull sea lion which the ball from Booterin's rifle had just destroyed, an old "starooka" came up abruptly. Not seeming to see me, she deliberately threw down a large, greasy, skin meat bag: she whipped out a knife and went to work on my specimen. Curiosity prompted me to keep still, in spite of the first sensation of annoyance, so that I might watch her choice and use of the animal's carcass.

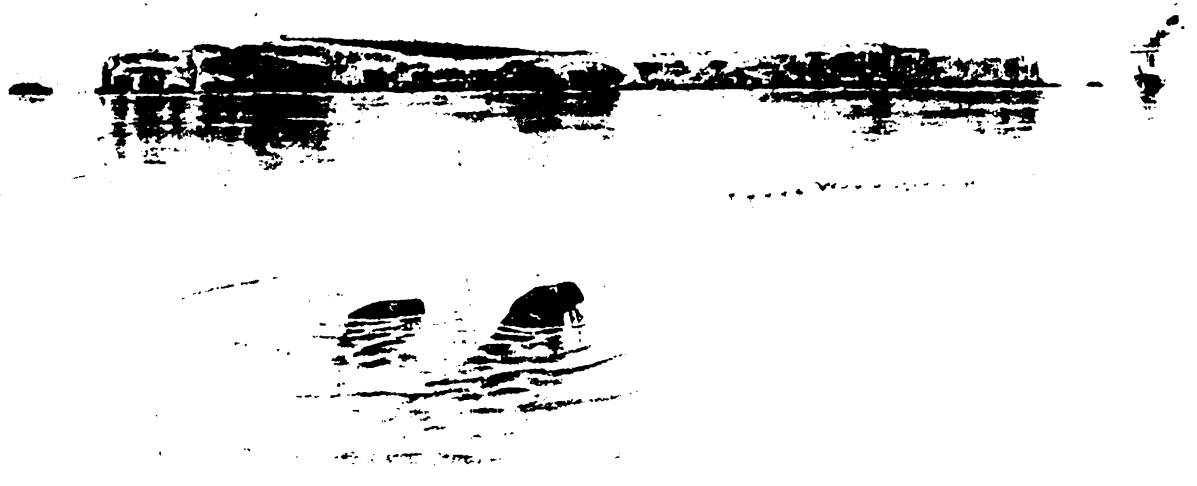
She first removed the skin, being actively aided in this operation by an uncouth boy; she then cut off the palms to both fore flippers. The boy at the same time pulled out the mustache bristles. She then cut out its gullet, from the glottis to its junction with the stomach, care-

[1]The Aleutian name for this garment is unpronounceable in our language and equally so in the more flexible Russian; hence the Alaskan "kamlaika," derived from the Siberian "kamlaia." That is made of tanned reindeer skin, unhaired, and smoked by larch bark until it is colored a saffron yellow, and is worn over the reindeer-skin undershirt, which has the hair next to the owner's skin and the obverse side stained red by a decoction of alder bark. The kamlaia is closed behind and before, and a hood, fastened to the back of the neck, is drawn over the head when leaving shelter; so is the Aleutian kamlaika, only the one of Kolyma is used to keep out piercing dry cold, while the garment of the Bering Sea is a perfect water repellant.

fully divesting it of all fleshy attachments and fat. Then she cut free the stomach itself and turned it inside out, carelessly scraping the gastric walls clean of copious biliary secretions, the inevitable bunch of *ascaris*, etc. She then told the boy to take hold of the duodenum end of the small intestine, and, as he walked away with it, she rapidly cleared it of its attachments, so that it was thus uncoiled to its full length of at least 60 feet. Then she severed it: and then it was recoiled by the "melchiska," and laid up with the other members just removed, except the skin, which she had nothing more to do with. She then cut out the liver and ate several large pieces of that workhouse of the blood before dropping it into the meat pouch. She then raked up several handfuls of the "leaf lard," or hard, white fat that is found in moderate quantity around the viscera of all these pinnipeds, which she also dumped into the flesh bag. She then drew her knife through the large heart, but did not touch it otherwise, looking at it intently, however, as it still quivered in unison with the warm flesh of the whole carcass. She and the boy then poked their fingers into the tumid lobes of the immense lungs, cutting out portions of them only, which were also put into the grimy pouch aforesaid. Then she secured the gall bladder, and slipped it into a small yeast-powder tin, which was produced by the urchin. Then she finished her economical dissection by cutting the sinews out of the back in unbroken bulk from the cervical vertebra to the sacrum; all these were stuffed into that skin bag, which she threw on her back and supported it by a band over her head. She then trudged back to the barrakbie, from whence she sallied a short hour ago like an old vulture to the slaughter. She made the following disposition of its contents: The palms were used to sole a pair of tarbosars, or native boots, of which the uppers and knee tops were made of the gullets: one sea-lion gullet to each boot top; the stomach was carefully blown up, and left to dry on the barrakbie roof, eventually to be filled with oil rendered from sea-lion or fur-seal blubber. The small intestine was carefully injected with water and cleansed, then distended with air, and pegged out between two stakes 60 feet apart, with little cross slats here and there between, to keep it clear of the ground. When it is thoroughly dry it is ripped up in a straight line with its length and pressed out into a broad band of parchment gut, which she cuts up and uses in making a water-proof "kamlaikie," sewing it with those sinews taken from the back. The liver, leaf lard, and lobes of the lungs were eaten without further cooking, and the little gall bag was for some use in poulticing a scrofulous sore. The mustache bristles were a venture of the boy, who gathers all that he can, then sends them to San Francisco, where they find a ready sale to the Chinese, who pay about 1 cent apiece for them. When the natives cut up a sea-lion carcass, or one of a fur seal on the killing grounds for meat, they take only the shoulders and the loins. Later in the season they eat the entire carcass, which they hang up by the hind flippers on a "labaas" by their houses.

The St. George natives manage to secure a good many cod and halibut, but the St. Paul people have very poor luck fishing; so what they get in this line is really unimportant. In the early years—1870–1878—they all used their own boats, i. e., bidarkas: but during the last ten or twelve years, they have purchased yawls and whitehall boats of our make, for fishing, egging trips, etc. They are not active fishermen in any sense of the word. They are very fond, however, of sea eggs, and frequently the natives have brought a dish of sea urchins' ovaries for our table, offering it as a great delicacy. I do not think any of us did more than to taste it. The native women are the chief hunters for

PLATE 34.



A drawing from nature by the author.

WALRUS ISLET, FROM THE EAST, 6 MILES DISTANT FROM SAINT PAUL ISLAND, AUGUST 7, 1890.

The snow-like white capping to the cliffs is the guano of the arries (*L. arra*); these birds, together with gulls, auks, and sea parrots breed here in countless numbers.

Echinoidæ, and during the whole spring and summer seasons they may be seen at both islands, wading in the pools at low water, with their scanty skirts high up, eagerly laying possessive hands upon every "bristling" egg that shows itself. They vary this search by poking with a short-handled hook into holes and rocky crevices for a small cottoid fish, which is also found here at low water, in this manner. Specimens of this "kalog," which I brought down, declared themselves as representatives of a new departure from all other recognized forms in which the sculpin is known to sport; hence the name, generic and specific, *Melletes papilio*.

By the 28th of May to the middle of June a fine table crab,[1] large, fat, and sweet, with a light, brittle shell, is taken while it is skurrying in and out of the lagoon as the tide ebbs and flows. It is the best-flavored crustacean known to Alaskan waters. The natives affirm the existence of mussels here in abundance when the Pribilov group was first discovered, but now, only a small supply of inferior size and quality is to be found.

The native cooking is all done now in their houses on small cast-iron stoves of American pattern and make. In olden times the unavoidable use of fur-seal blubber in culinary operations caused the erection outside of most "barrabaras," of a small sod-walled and low dirt-roofed kitchen, in which the strong-smelling blubber fires were kept. Indifferent as the natives became to smells and smoke in the filthy life of early days upon these islands, yet the acrid, stifling, asthmatic effect of the blubber clouds never failed to punish them whenever they attempted to make use of such a fire in their living rooms. Most of these "cookhnets," or "povarniks," were in full blast when I first landed at St. Paul: and, coming frequently into range of their smoky effluvium I was infinitely annoyed. Now, however, the complete substitution of new frame houses for the "barrabkies" has, I believe, caused a perfect abatement of the nuisance: it did last summer to my glad knowledge.

On account of the severe climatic conditions it is, of course, impracticable to have any sort of a vegetable garden, or to keep stock here with any profit or pleasure. The experiment has been tried faithfully. It is found best to bring beef cattle up in the spring on the steamer: turn them out to pasture until the close of the season in October and November, and then, if the snow comes, to kill them and keep the meat refrigerated the rest of the year. Stock can not be profitably raised here; the proportion of severe weather annually is too great. From six to perhaps eight months of every year they require feeding and watering, with good shelter. To furnish an animal with hay and grain up there is a costly matter, and the dampness of the growing summer season on both islands renders haymaking impracticable. The natives keep a few chickens. Some years they do very well, then an epidemic will break out, and for several seasons thereafter poultry raising is a complete failure on the islands; in short, chickens are kept with much difficulty; in fact, it is only possible to save their lives when the natives take them into their own rooms, or keep them above their heads in the little attics to their own dwellings during severe winters.

But for some reason or other these people have a strange passion for seal-fed pork, and in 1872–1874 there were quite a large number of hogs on the island of St. Paul and a few on St. George. The pigs soon become entirely carnivorous, living, to the practical exclusion of all other diet, on the carcasses of seals. It appears, however, that these hogs became so numerous by 1879–80 that the agents of the Government and company in 1881–1884 made up an indictment against the

[1] *Telemessus cheiragonus.*

seal-island hogs, and proceeded to shoot them right and left, until the extermination of the species soon followed. The natives offered no resistance, but they still plead for permission to keep hogs.[1] Last but not least in this statement of native food resources, is the annual unlimited supply of water fowl from May until November—auks, arries, gulls, many ducks, and a few geese, the flesh and eggs of which are extensively consumed. After the dead silence of a long ice-bound winter the arrival of large flocks of those sparrows of the north, the "choochkies" (*Phaleris microceros*), is most cheerful and interesting. These plump little auks are bright, fearless, vivacious birds, with bodies round and fat. They come usually in chattering flocks on or immediately after the 1st of May, and are caught by the people with hand scoops or dip nets to any number that may be required for the day's consumption. Their tiny, rotund forms make pies of rare, savory virtue, and they are also baked, roasted, and stewed in every conceivable shape by the Russian cooks; indeed, they are equal to the reed birds of the South. These welcome visitors are succeeded rapidly by thousands and countless tens of thousands of guillemots or "arries" (*Lomvia arra*). This bird is the great egg producer of that region.

These people are singularly affectionate and indulgent toward their children. There are no "bald-headed tyrants" in our homes as arbitrary and ruthless in their rule as are those snuffy babies and young children on the seal islands. While it is very young, the Aleut gives up everything to the caprice of his child, and never crosses its path or thwarts its desire. The "deetiah" literally take charge of the house. But as soon as these callow members of the family become strong enough to bear burdens and to labor, generally between 12 and 15 years of age, they are then pressed into hard service, relentlessly, by their hitherto indulgent parents. The extremes literally meet in this application. The urchins play marbles, spin tops, and fly kites intermittently with all the feverish energy displayed by the youth of our own surroundings; they frolic at baseball and use "shinny" sticks with much volubility and activity. The girls are, however, much more repressed: and, though they have a few games and play quietly with quaintly dressed dolls, yet they do not appear to be possessed of that usual feminine animation so conspicuously marked in our home life.

One of the peculiarities of these people is that they seldom undress when they go to bed, neither the men, women, nor children; and also that at any and all hours of the night during the summer season, when I have passed in and out of the village to and from the rookeries, I always found several of the natives squatting before their house doors or leaning against the walls stupidly staring out into the misty darkness of the fog or chatting one with the other over their pipes. A number of the inhabitants by this disposition are always up and around throughout the settlement during the entire night and day. In olden times, and even recently, these involuntary sentinels of the night have often startled the whole village by shouting at the top of their voices the pleasant and electric announcement of the "ship's light!" or have frozen it with superstitious horror by the recital at daybreak, of ghostly visions.

The inherent propensity of man to gamble is developed here to a very appreciable degree: but, it in no way suggests the strange gaming love and infatuation with which the Indians and Eskimo elsewhere of Alaska are possessed. The chief delight of the men and boys of the two villages is to stand on the street corners pitching half dollars. So

[1] I think that they should be permitted to keep a few, if they will pen them up and care for them properly.

PLATE 35.

A drawing from nature by the author.

POLAVINA SOPKA, SAINT PAULS ISLAND.
(8 miles distant.)

SEA BIRDS BREEDING ON WALRUS ISLAND, JULY 4, 1872.

devoted indeed have I found the native mind to this haphazard sport that frequently I would detect groups of them standing out in pelting gales of wind and rain "shying" their silver coin at the little dirt-driven pegs. A few of them, men and women, play cards with much skill and intelligence.

The attachment which the natives have for their respective islands was well shown to me in 1874. Then a number of St. George people were taken over to St. Paul temporarily to do the killing incidental to a reduction of the quota of 25,000 for their island and a corresponding increase at St. Paul. They became homesick immediately: and, were never tired of informing the St. Paul natives that St. George was a far handsomer and more enjoyable island to live upon; that walking over the long sand beaches of "Pavel" made their legs grievously weary; and that the whole effect of this change of residence was "ochen scootchnie." Naturally the ire of the St. Paul people rose at once, and they retorted in kind, indicating the rocky surface of St. George and its great inferiority as a seal island. I was surprised at the genuine feeling on both sides, because, as far as I could judge from a residence on each island, it was a clear case of tweedle-dee and tweedle-dum between them as to opportunities and climate necessary for a pleasurable existence. The natives themselves are of one and common stock, though the number of Creoles on St. George is relatively much larger than on St. Paul; consequently the tone of the St. George settlement is rather more sprightly and vivacious.

This question is often asked, How do these people employ themselves during the long nine months of every year after the close of the sealing season and until it begins again, when they have little or absolutely nothing to do? It may be answered that they simply vegetate: or, in other words, are entirely idle, mentally and physically, during most of this period. But to their credit let it be said that mischief does not employ their idle hands. They are passive killers of time, drinking tea and sleeping, with a few disagreeable exceptions, such as the gamblers. There are a half dozen of these characters at St. Paul, and perhaps as many at St. George, who pass whole nights at their sittings, even during the sealing season, playing games of cards taught by Russians and persons who have been on the island since the transfer of the territory. But the majority of the men, women, and children, not being compelled to exert themselves to obtain any of the chief or even the least of the necessaries of life, such as tea and hard bread, sleep the greater portion of the time, when not busy in eating and in the daily observances of the routine belonging to the Greek Catholic Church. The teachings, pomp, and circumstance of the religious observances of this faith alone preserve these people from absolute stagnation. In obedience to its teachings, they gladly attend church very regularly. They also make and receive calls on their saints' days, and these days are very numerous. I think some 160 of the whole year's calendar must be given up to the ceremonies attendant upon the celebration of some holy birth or death.

In early times the same disgraceful beer-drinking orgies which prevailed to so great an extent and still cause so much misery and confusion, seen elsewhere in the Territory, prevailed here: and, I remember very well the difficulty which I had in initiating the first steps taken by the Treasury Department, to suppress this abominable nuisance. During the last fourteen or fifteen years, it gives me pleasure to say, since the new order of things was inaugurated, the several agents of the Department have faithfully executed the law.

The natives add to these entertainments of their saints' days and birth

festivals, or "Emannimiks," the music of accordeons and violins. Upon the former and its variation, the concertina, they play a number of airs, and are very fond of the noise. A great many of the women, in particular, can render indifferently a limited selection of tunes, many of which are the old battle songs so popular during the rebellion, woven into weird Russian waltzes and love ditties, which they have jointly gathered from their former masters and our soldiers, who were quartered here in 1869. From the Russians and the troops, also, they have learned to dance various figures and have been taught to waltz. These dances, however, the old folks do not enjoy very much. They will come in and sit around and look at the young performers with stolid indifference; but, if they manage to get a strong current of tea setting in their direction, nicely sugared and toned up, they revive and join in the mirth. In old times they never danced here unless they were drunk; and it was the principal occupation of the amiable and mischievous Treasury agents and others in the early days, to open up this beery fun. Happily, that nuisance is abated. During the last six or eight years they have organized a very good string and brass band on St. Paul Island, and play well.

NUMBER OF THE ISLANDERS.

The population[1] of St. Paul Island in 1872 was 235 souls; to-day, in 1890, it is 213 souls. Of St. George Island in 1872, it was 127 souls; to-day it is 98. This declares a decrease, since then, of 93. Prior to 1873 they had neither much increased nor diminished for 50 years, but would have fallen off rapidly (for the births were never equal to the deaths) had not recruits been regularly drawn from the mainland and other islands every season when the ships came up. As they lived then, it was a physical impossibility for them to increase and multiply. But since their elevation and their sanitary advancement became so marked it was reasonably expected that those people for all time to come would at least hold their own, even though they do not increase to any remarkable degree. Perhaps it is better that they should not. They are, of all men, especially fitted for the work connected with the seal business. No comment is needed. Nothing better in the way of manual labor, skilled and rapid, could be rendered by any body of men equal in numbers living under the same circumstances all the year round. They appear to shake off the periodic lethargy of winter and its forced inanition, to rush with the coming of summer, into the severe exercise and duty of capturing, killing, and skinning the seals with vigor and with persistent and commendable energy.

To-day, only a very small proportion of the population are descendants of the pioneers who were brought here by the several Russian companies in 1787 and 1788; a colony of 137 souls, it is claimed, principally recruited at Unalaska and Atka. The principal cause of death among the people by natural infirmity on the seal islands is the varying forms of consumption and bronchitis, always greatly aggravated by that inherited scrofulous taint or stain of blood which was, in one way or another, flowing through the veins of their recent progenitors, both here and throughout the Aleutian Islands. There is nothing worth noticing in the line of nervous diseases, unless it be now and then the record of a case of alcoholism, superinduced by excessive quass drinking. This "makoolah" intemperance among these people, which was

[1] In the report of Mr. Goff, extracts of which I reprint in Section VIII, will be found all the details of the earnings, etc., of these people.

not suppressed until 1876, was a chief factor to the immediate death of infants; for, when they were at the breast, the mothers would drink quass to intoxication, and the stomachs of the newly born Aleuts or Creoles could not stand the infliction which they received, even second-hand. Had it not been for this wretched spectacle so often presented to my eyes in 1872–73, I should hardly have taken the active steps which I did to put the nuisance down, for it involved me, at first, in a bitter personal controversy which, although I knew at the outset it was inevitable, still weighed nothing in the scales against the evil itself.[1]

A few febrile disorders are occurring, yet they yield readily to good treatment, but they have this peculiarity: when they are ill, slightly or seriously, no matter which, they maintain or affect a stolid resignation, and are patient to positive apathy. This is not due to deficiency of nervous organization, because those among them, who exhibit examples of intense liveliness and nervous activity, behave just as stolidly when ill, as their more lymphatic townsmen do. Boys and girls, men and women, all alike, are patient and resigned when ailing and under treatment. But, it is a bad feature, after all, inasmuch as it is well-nigh impossible to rally a very sick man who himself has no hope, and who seems to mutely deprecate every effort to save his life.

[1] This evil of habitual and gross intoxication under Russian rule was not characteristic of these islands alone; it was universal throughout Alaska. Sir George Simpson, speaking of the subject when in Sitka, April, 1842, says: "Some reformation certainly was wanted in this respect; for of all the drunken, as well as of all the dirty places that I had visited, New Archangel (Sitka) was the worst. On the holidays, in particular, of which, Sundays included, there are 165 in the year, men, women, and even children were to be seen staggering about in all directions." (Simpson: Journey Around the World, 1841–42, p. 88.)

SECTION VI.

CONDUCT OF NATIVE LABOR AND PAY IN 1872–1874 AND 1890 ON THE PRIBILOV ISLANDS.

Living as the seal islanders do, and doing what they do, the seal's life is naturally their great study and objective point. It nourishes and sustains them. Without it they say they could not live, and they tell the truth. Hence their attention to the few simple requirements of the law, so wise in its provisions, is not forced or constrained, but is continuous. Self-interest in this respect appeals to them keenly and eloquently. They know everything that is done, and everything that is said by anybody and by everybody in their little community. Every seal drive that is made, and every skin that is taken, is recorded and accounted for by them, by their chiefs and their church, when they make up their tithing roll at the close of each season's labor. Nothing can come to the islands, by day or by night, without being seen by them and spoken of. I regard the presence of these people on the islands at the transfer, and their subsequent retention and entailment in connection with the seal business, as an exceedingly good piece of fortune, alike advantageous to the Government, to the company, and to themselves.

When we go back to the beginning of the sealing industry on these islands, the time of Pribilov and his rivals in 1786, to 1799 and 1801, and attempt to find any record of the conduct of the labor or compensation paid to laborers here, we discover nothing that throws the least light upon the subject. When the old Russian-American Company was put into supreme control of all Alaska in 1799, and Baranov had time in 1803 to visit these islands and close them to everybody save his own agents, we may safely assume to know pretty well what was done in this respect. We know it because we have the following statement from the best authority:

> The Aleuts serving the company sustain the following relations between themselves and it, to wit: Each of them worked without solicitation, were ordered to do whatever was found and to which they were directed, or at that which they understood best. Payment for their toil was not established by the day or by the year, but in general for each thing taken by them, or standing or put to their credit by the company; for instance, especially the skins of animals, the teeth of walrus, barrels of oil, etc. These sums, whatever they might be, were placed by the company to their credit, for all general working and hunting was established or fixed for the whole year fairly. These Aleuts in general, receive no specific wages and they are not all alike or equal, there being usually three or four classes.
>
> In these classes, to the last or least, the sick and old workmen are counted in, although they are only burdens and, therefore, they receive the smaller shares, about 150 rubles (i. e., $40) a year, and the other and better classes receive from 220 to 250 rubles per year ($55 to $60). Those who are zealous are rewarded by the company with 50 to 100 rubles ($10 to $25). The wives of the Aleuts who worked at the seal hunting received from 25 to 35 rubles ($6 to $9) per annum. (Veniaminov: Zapieska, etc., St. Petersburg, 1840.)

This definition of the subject by Bishop Veniaminov shows us the precise relation and nature of pay that we are looking for. It covers the whole of that extended period from 1801 to 1868, sixty-seven years.

The rubles that all payment in Alaska during that time was made in were paper or parchment tags, stamped with the private mark of the old company, and rated at about 20 cents per ruble, in the Aleutian district, according to Veniaminov: inasmuch as he states that in 1835, "4 paper rubles here are worth one of silver."

At the time of the transfer of Alaska, July, 1867, and from that time until December, 1867, nothing was known by the people on these islands of the change: and they had no realization of the significance of that change until April, 1868, when three rival American sealing parties landed on St. Paul Island within a few days of each other, and promptly began to make preparations for the coming of the seals, and taking their skins. Four different parties under the American flag established themselves a little later, if at all behind, on St. George. These several parties, all bent on sealing, and many of them having old antarctic fur sealers in control, were anxious and desirous of securing all the native labor, each one to itself, as against its rivals. The foremen then began to offer to pay the natives more and more, as they bid over one another, per skin, when delivered during the sealing season. They finally found that they would bid so high for the native labor in this manner, as to leave no profit. This brought them to an amicable agreement among themselves, by which they would pay no more nor less than 40 cents per skin delivered by the natives. Then the natives worked for all hands during the season of 1868, without any particular advantage in serving one party better than the other.

This season's work of 1868 fixed the price of labor for skinning a young male fur seal at 40 cents for the first time on these islands; a tariff at least four times greater than ever before received by the native sealer here; and this rate of 40 cents was at once assumed and paid by the Alaska Commercial Company at the inception of its lease in 1870, and continued in the new lease of 1890, to the North American Commercial Company, by order of the Secretary of the Treasury for the present season of 1890.

During the last twenty years, and throughout the present season, the natives themselves worked under the direction of their own chosen foremen, or "toyone." This chief calls out the men at the break of every working day, divides them into detachments according to the nature of the service, and orders their doing. All communication with the laborers on the sealing ground and the company passes through his hands. These chiefs have every day an understanding with the agent of the company as to his wishes, and they govern themselves thereby.

The company directs its own labor in accordance with the law as it sees fit; selects its time of working, etc., in accordance with and obedience to the regulations of the Secretary of the Treasury from year to year.

The Treasury officials on the seal islands are charged with the careful observance of every act of the company; a copy of the lease and its covenant is conspicuously posted in their office; is translated into Russian, and is familiar to all the natives. The care and supervision of the welfare of the rookeries and of the natives was and is their chief charge.

The old company paid, and the new company pays 40 cents for the labor of taking each skin. The natives take the skins on the killing ground. Then the skins are brought up and counted into the salt houses, where the agent of the company receives them from the hands of his own employees. When the quota of skins is taken, at the close of two, three, or four weeks of labor, as the case may be, the total sum for the entire catch is paid over in a lump to the chiefs: and these men

divide it among the laborers according to their standing as workmen, which they themselves have agreed upon by special tally sticks. For instance, at the annual division or "catch" settlement made by the natives on St. Paul Island among themselves in 1872, when I was present, the proceeds of their work for that season in taking and skinning 75,000 seals, at 40 cents per skin, with extra work connected with it, making the sum of $30,637.37, was divided among them in this way: There were 74 shares made up, representing 74 men, though in fact only 56 men worked: but they wished to give a certain proportion to their church, a certain proportion to their priest, and a certain proportion to their widows, so they watered their stock, commercially speaking. The 74 shares were proportioned as follows:

37 first-class shares, each	$451.22
23 second-class shares, each	406.08
4 third-class shares, each	360.97
10 fourth-class shares, each	315.85

And since 1870, up to 1890, they have never received less than this, except in one season (1877), when only 80,000 instead of 100,000 were taken. But, last summer the catch on St. Paul was little more than 16,500 skins, so that the division was but slightly over one-fifth of the cash equivalent of the annual settlement hitherto, during the past nineteen years.

In August, 1873, while on St. George Island, I was present at a similar division under similar circumstances, which caused them to divide among themselves the proceeds of their work in taking and skinning 25,000 seals, at 40 cents a skin, $10,000. They made the following subdivision.

	Per share.
17 shares each, 961 skins	$384.40
2 shares each, 935 skins	374.00
3 shares each, 821 skins	328.40
1 share each, 820 skins	328.00
3 shares each, 770 skins	308.00
3 shares each, 400 skins	160.00

These 29 shares referred to, represent only 25 able-bodied sealers, 2 of whom were women. This method of division as above given is the result of their own choice. Four shares went to the church.

In August, 1890, I was again present on St. George when the list was made up, but instead of the division being based upon the proceeds of taking 25,000 skins, it was the mere form of dividing $50 or $60 apiece among the sealers, who have been able to take only 4,132 skins on St. George this year.

There has always been much difference of opinion as to how this annual settlement should be made among the natives. I said in 1874:

> It is an impossible thing for the company to decide their relative merits as workmen on the ground, so they have wisely turned its entire discussion over to them. Whatever they do they must agree to; whatever the company might do they possibly and probably would never clearly understand, and hence dissatisfaction and suspicion would inevitably arise. As it is, the whole subject is most satisfactorily settled.

I am still of that opinion: but, since then a gradual removal of the whole control from the natives has been made in the following manner: At the close of the season's work, i. e., when the quota has been secured, by the 16th to the 20th of July as a rule, the chiefs and their people would make up their division in the method above described. This, when submitted to the company's agent and the Treasury officer, was usually altered by changing the names of the notorious loafers in the

A drawing from nature by the author.

CROSS HILL.

LOADING BUNDLED FUR-SEAL SKINS FROM THE SALT HOUSE TO THE SHIP, JULY 17, 1872.

View of natives and bidarrah at work, Northeast Point, Saint Paul Island; Cross Hill and Sand Dunes in middle distance.

sealing gang into those lower grades of the division and putting better men up. The loafers were usually men of influence with the church, and, strange as it may seem, with their own industrious townsmen, so they were able to have their names generally placed at the top of this list. Strictly speaking, this action of the agents of the company and Government in revising the list, was entirely in the right, but the natives were better satisfied with their old way of 1872–1874, for the reasons which I give in the citation above.

This payment of 40 cents per skin taken by the natives covers nothing except the labor of driving the seals, skinning them, and helping the outside employees of the lessees to salt them in the salt houses. The extra work of bundling these skins for shipment was paid for by the bundle—1 cent per bundle—so that a smart native could make $2 per day while at this work. Then, when the ships arrived and sailed, the great and necessary labor of lightering their cargoes, off and on, from the roadsteads where vessels anchor, was principally performed by these people: and they were paid so much a day for their labor, from 50 cents to $1, according to the character of the service they rendered. This operation, however, is much dreaded by the ship captains and seagoing men, whose habits of discipline and automatic regularity and effect of working, render them severe critics and impatient coadjutors of the natives: who, to tell the truth, hated to do anything after they had pocketed their reward for sealing; and, when they did labor after this, they regarded it as an act of very great condescension on their part.

Until 1882, all the labor outside of sealing incident to the business on these islands, was executed by the natives of the two settlements of St. Paul and St. George, with the aid of a half dozen white men on shore, employees of the lessees, and the crews of their vessels. But in 1882 an epidemic of typhoid pneumonia scourged the village of St. Paul, and fully one-half of the able-bodied men were dead when it subsided in 1883. This made it necessary for the lessees to bring up thirty or forty natives from Oonalashka every sealing season thereafter, to do this work of salting and bundling skins and unloading and loading the vessels. These outside laborers came up on the lessees' steamer every May, or by the 1st of June: were quartered ashore: and worked here until the close of the season in July; then returned by the 3d to 10th of August, to Unalashka, receiving pay at the rate of $40 per month and found. They never have been permitted to drive or skin seals. That work has been done entirely by the Pribilov men ever since 1870, up to the present hour.

In 1872–1874 and up to 1885, these seal islanders elected their chiefs after their own choice. They finally got into so much internal liking and disliking over this selection that the chiefs so elected began to be disobeyed and slighted by many of their men. Thereupon, the Treasury agent and the company's representative in charge, took the matter up, selected a new man, and pronounced him chief. That settled the difficulty and ended it; he was promptly obeyed.

Some of the natives save their money: but there are very few among them, perhaps not more than a dozen, who have the slightest economical tendency. What they can not spend for luxuries, groceries, and tobacco, they manage to get away with at the gaming table. They have their misers and their spendthrifts, and they have the usual small proportion who know how to make money and then how to spend it. A few among them who are in the habit of saving, opened a regular bank account with the company. Some of them have to-day $2,000 or $3,000 saved, drawing interest at 4 per cent.

SECTION VII.

THE PROTECTION AND PRESERVATION OF THE FUR-BEARING INTERESTS OF OUR GOVERNMENT ON THE PRIBILOV ISLANDS—THE IMMEDIATE ACTION NECESSARY, VIEWED IN THE FULL LIGHT OF EXISTING DANGER.

Those statements and exhibitions of fact contained in the foregoing Sections, I to IV, inclusive, warrant me in declaring that the close of the present season's work of 1890 brings a grave question and its alternative promptly forward—*shall our Government make no further effort to prevent the extermination of its sealing preserves on the Pribilov Islands?* or, *will it step forward again and try anew to prevent that ruin?*

There is a universal, a hearty wish, not only at home, but abroad, that these Alaskan fur-seal rookeries be preserved: and a hope that these anomalous and valuable interests can be saved: and every reputable commercial, scientific, and political organization throughout the whole civilized world will applaud any action that will draw the Powers of Great Britain, Russia, and the United States together in harmonious effort to that end.

Telling the truth, as I have been compelled to tell it in detail, will have, however, this compensation—it will arouse and enlist the sympathy and support of a very large element that has heretofore declared its utter indifference as to whether the hunting of fur seals in the open waters of Bering Sea was prohibited, or not: since it believed that the last official reports published up to 1889, as filed in the Treasury Department, were correct in declaring that the Pribilov fur seals were vastly increased and increasing still over their fine form and number of 1872–1874.[1] And it also said, "What real harm are these poachers doing? Why, only look at the figures! after all their work, yet in spite of it, there are more seals than ever on those islands. Their work may annoy and injure somewhat the leased monopoly up there, but what of that? If the seals can stand it, we do not feel concerned."

Those erroneous statements made in 1886, 1887, and 1888[2] by official reports to the Treasury, declaring a steady increase of seals on the Pribilov Islands, have given to the pelagic sealers during the last four years, solid aid and comfort, that has been advanced to them from official circles not only at home, but in Great Britain and Canada: and which would not have been proffered from any quarter for a moment, had the fact been believed that ever since 1882, the Pribilov seals have been declining in number, rapidly dwindling ever since 1886.

Those, who did not, and do not believe that we are right in claiming Bering Sea as a *mare clausum* will at once heartily unite with those who do believe in that doctrine, in so far as making it a closed sea to all pelagic sealing at the moment such action becomes necessary to prevent an extermination of those world-renowned rookeries of Bering Sea. And, in the presence of this threatening ruin, the most pro-

[1] See Appendix, pp. 205-207. [2] See Appendix, pp. 203-207.

nounced opponents of the leasing system, monopolies, etc., will be equally prompt in joining hands with those who do believe in this plan, to advance any order that promises preservation and conservation.

But, this plan of restoration must be an unselfish one: must be free from any taint of private gain or profit, or it will fail to receive this universal sympathy and indorsement. *It will fail, and it ought to fail, if it is not so planned.*

Before sketching an outline of the action which I deem necessary for the Secretary of the Treasury to take for the coming season of 1891, and that legislation by Congress to strengthen his hands, the following account[1] of a similar decline of the seal life on these Pribilov Islands and its restoration, way back from 1817 to 1834, is pertinent in this connection:

INDISCRIMINATE SLAUGHTER BY THE FIRST DISCOVERERS.

From the time of the discovery of the Pribilov Islands up to 1805 (or that is. until the time of the arrival in America of General Resanov),[2] the taking of fur seals on both islands progressed without count or lists, and without responsible heads or chiefs, because then (1787 to 1805, inclusive) there were a number of companies, represented by as many agents or leaders, and all of them vied with each other in taking as many as they could before the killing was stopped. After this, in 1806 and 1807, there were no seals taken, and nearly all the people were removed to Unalashka.

PARTIAL CHECK ORDERED.

In 1808 the killing was again commenced, but the people in this year were allowed to kill only on St. George. On St. Paul, hunters were not permitted this year, or the next. It was not until the fourth year after this that as many as half the number previously taken were annually killed. From this time (St. George 1808 and St. Paul 1810) up to 1822, taking fur seals progressed on both islands without economy and with slight circumspection, as if there were a race in killing for the most skins. Cows were taken in drives and killed, and were also driven from the rookeries to places where they were slaughtered.

It was only in 1822, that G. Moorayvev (governor) ordered that young seals should be spared every year for breeding: and from that time there were taken from the Pribilov Islands, instead of 40,000 to 50,000, which Moorayvev ordered to be spared in four successive years, no more than 8,000 to 10,000. Since this, G. Chestyahkov, chief ruler after Moorayvev, estimated that from the increase resulting from the legislation of Moorayvev, which was so honestly carried out on the Pribilov Islands, that in these four years the seals on St. Paul had increased to double their previous number, (*that*) he could give an order which increased the number to be annually slain to 40,000; and this last order or course directed for these islands, demanded as many seals as could be got: but, with all possible exertion, hardly 28,000 were obtained.

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[1] Translated by the writer from Veniaminov's *Zapieskie, etc.*, St. Petersburg, 1842, Vol. II, p. 568. The italics are mine, and my translation is nearly literal, as might be inferred by the idiom here and there.

[2] Resanov, in his official letter to the Emperor of Russia dated Oonalaska Island, July 28, 1805, says: "The multitude of seals in which St. Paul abounds is incredible. The shores are covered with them. They are easily caught, and as we were short of provisions 18 were killed for us in half an hour. But at the same time we were informed that they had decreased in number 90 per cent since earlier times. These islands would be an inexhaustible source of wealth were it not for the Bostonians, who undermine our trade with China in furs, of which they obtain large numbers on our American coast. As over a million had already been killed, I gave orders to stop the slaughter at once, in order to prevent their total extermination, and to employ the men in collecting walrus tusks, as there is a small island near St. Paul covered with walrus." He adds that he met with sufficient evidences of carelessness and waste: "The skins of the fur seal were scattered about over the beach and the bluff in various stages of decomposition. The storehouses were full, but only a small part of their contents was in a marketable state." As many as "30,000 had been killed for their flesh alone," the skins having been "left on the spot or thrown into the sea." After questioning the Aleutian laborers and Russian overseers, Resanov came to the conclusion that unless an end were put to this wanton destruction, a few years more would witness the extirpation of the fur seal.—[H. W. E.]

POOR RESULTS.

After this, when it was most plainly seen that the seals were, on account of this wicked killing, steadily growing less and less in number, the directions were observed for greater caution in killing the grown seals and young females which came in with the droves of killable seals, and to endeavor to separate, if possible, these from those which should be slain.

PARTIAL CHECKS AGAIN ORDERED.

But all this hardly served to do more than keep the seals at one figure or number, and hence did not cause an increase. Finally, in 1834, the governor of the company, upon the clear (*or "handsome"*) argument of Baron Wrangel, which was placed before him, resolved to make new regulations respecting them, to take effect in the same year (1834), and, following this, on the island of St. Paul only 4,000 were killed instead of 12,000.

On the island of St. George the seals were allowed to rest in 1826 and 1827, and since that time greater caution and care have been observed, and headmen, or foremen, have kept a careful account of the killing.

From this it will be seen, that no anxiety or care as to the preservation of the seal life began until 1805 (i. e., with the united companies).

It is further evident that all half measures, seen or not seen, were useful no longer, as they only served to preserve a small portion of the seal life, and only the last step (1834) with the present people or inhabitants has proved of benefit. And if such regulations of the company continue for fifteen years (i. e., until 1849), it may be truly said that then the seal life will be attracted quite rapidly, under the careful direction of headmen, so that in quite a short time a handsome yield may be taken every year. In connection with this subject, if the company is moderate, and these regulations are carried out, the seal life will serve them, and be depended upon, as shown in this volume, Table No. 2.

IDEAS OF THE OLD NATIVES, AS TO VIRILITY OF DRIVEN SEALS.

Nearly all the old men think and assert that the seals which are spared every year (*"zapooskat kotov"*), i. e., those which have not been killed for several years, are truly of little use for breeding: lying about as if they were outcasts or disfranchised. About these seals, they show that after the seals were spared, they were always less than they should be: as, for instance, on the island of St. George, after two years of saving or sparing of 5,500 seals, in the first year they got, instead of 10,000 or 8,000 as they expected, only 4,778.

WHY THE SEALS DIMINISHED.

But this diminution, which is shown in the most convincing manner, is due to wrong and injustice, because it would not have been otherwise with any kind of animals—even cattle would have been exterminated—because a great many here think and count that the seal mother brings forth her young in her third year, i. e., the next two years after her own birth.[1] As it is well shown here the spared seals (*"zapooskie"*) were not more than 3 years old, and therefore it was not possible to discern the correct and true numbers as they really were. Taking the females killed by the people, together with all the seals which were purposely spared, it was seen that the seal mothers did not begin to bear earlier than the fifth year of their lives. Illustrative of this is the following:

(*a*) On the island of St. George, after the first zapooka, in 1828, the killing of 5-year-old seals was continued gradually up to five times as many as at first. With those of 5 years old the killing stopped. Then next year twelve times as many 6-year-olds were observed on the islands, as compared with their number of the last year; and with, or in the seventh year, came seven times as many. This shows that females born in 1828 did not begin to bear young until their fifth year, and become with young accordingly; that the large ones did not appear or come in six years (from 1828), as is evident, for in the fifth year all the females did not bring forth.

(*b*) It is known that the male seals can not become "seecatchies" (*adult bulls*) earlier than their fifth or sixth year. Following this, it may be said that the female bears earlier than the fourth year.

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[1] And these natives were right. The females do bear their first young in the third year of their lives. Veniaminov falls into an error when he concludes that they do not. He has read a little too much of Buffon. Better not have read him at all.—H. W. E.

(*c*) If the male seal can not become a bull (seecatchie) earlier than the fifth year, then, as Buffon remarks, "animals can live seven times the length of the period required for their maturity." Therefore a seecatch can not live less than thirty years and a female not less than twenty-eight.[1]

VENIAMINOV'S BELIEF THAT FEMALES CAN NOT BEAR YOUNG UNTIL FOUR YEALS OLD.

Taking the opinion of Buffon for ground in saying that animals do not come to their full maturity until one-seventh of their lives has passed, it goes also to prove that the female seal can not bear young before her fourth year.

It is, without doubt, a fact that female seals do not begin to bear young before their fifth year, i. e., the next four years after the one of their birth, and not in the third or fourth year. That, however, is not the rule, but the exception. To make it more apparent that females can not bear young in their third year, consider 2-year-old females, and compare them with seecatchie (adult bulls) and cows (adult females), and it will be evident to all that this is impossible.

Do the females bear young every year; and how often in their lives do they bring forth?

HIS DOUBTS ON THE SUBJECT.

To settle this question is very difficult, for it is impossible to make any observations upon their movements. But I think that the females in their younger years (or prime) bring forth every year, and as they get older, every other year. Thus, according to people accustomed to them, they may each bring forth in their whole lives from 10 to 15 young and even more. This opinion is founded on the fact that never (except in one year, 1832) have an excessive number of females been seen without young; that cows not pregnant hardly ever come to the Pribilov Islands; that such females can not be seen every year. As to how large a number of females do not bear, according to the opinions and personal observations of the old people, the following may be depended upon with confidence: Not more than one-fifth of the mature or "effective" females are without young. But to avoid erroneous impressions or conflicting statements between others and myself, I would state that I have had but one season ("*trayt*") in which to personally observe and consider the multiplication of seals.

HIS THOUGHTS ON BIRTH OF PUPS.

There is one more very important question in the consideration of the breeding or the increase of seals, and that is, of the number of young seals born in one year how many are males? and is the number of males always the same in proportion to the females?

Judging from the holluschickie accumulated from the zapooska in 1822–1824 on the island of St. Paul and in 1826–27 on the island of St. George, the number of young males was widely variable. For example, on the island of St. Paul, in three years 11,000 seals were spared, and in the following three years there were killed 7,000, i. e., about two-thirds of the number saved. Opposed to this, on the island of St. George, from 8,500 seals spared in two years less than 3,000 were taken, hardly one-third.

Why this irregularity? Why should more young males be born at one time and at another less? Or, why should there be years in which many cows do not bear young?

According to the belief of the people here I think that of the number of seals born every year, half are males and as many females (*i. e., the other half*).

To demonstrate the above-mentioned conditions of seal life table No. 1 has been formed of the number of seals annually killed on the Pribilov Islands from 1817 to 1838 (when this work was ended).

From this it will be seen that—

(1) No single successive year presents a good number of seals killed as compared with the previous year; the number is always less.

(2) The annual number of seals killed was not in a constant ratio.

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[1]This remark is sustained by the observation of old men, and especially by one of the best creoles, Shiesneekov, who was on the island of St. Paul in 1817, and who knows of one seecatch (known by a bald head) which in that time had already a large herd of cows or females, surrounded and hunted by a like number of females and strong, savage old bulls. Therefore it may be safely thought that this bull did not get his growth until his fifth year, and at this time he could not have been less than ten years old. And this same bull came every year to the island and the same place for fifteen years in succession up to 1832, and it was only in the later years that his harem grew smaller and smaller in number.

(3) And therefore in the regular hunting season there is less need or occasion, during the next fifteen years, to demand the whole seal kind.

(4) Fewer seals were killed in those years generally following a previous year in which there were larger numbers of the holluschickie—that is, when the young males were not completely destroyed—and more were killed when the number of holluschickie was less.

(5) The number of holluschickie is a true register or showing of the number of seals; i. e., if the holluschickie increase and exist like the young females, and conversely.

(6) Holluschickie break from the (common) herd and gather by themselves no earlier than the third year, as seen in the case of the spared seals on the islands of St. George and St. Paul, the latter from 1822–1824 to 1835–1837, inclusive; the former from 1826–27.

(7) The number of seals killed on the island of St. George after two years (zapooska) was resumed and gradually increased to five times as many.

(8) In the fifth year from the first zapooska (*or saving*) it became impossible to count or reckon on the number remaining, and 6-year olds began to appear twelve times as numerous and 7-year-olds came in numbers sevenfold greater than their previous small number, and therefore the number of 3-year-old seals was quite constant.

(9) If on the island of St. George in 1826-27 the seals had not had this rest (zapooska) and the killing had been continued even at the diminished ratio of one-eighth, in 1840 or 1842 there would not have been a single seal left, as appears by the following table:

	Seals.		Seals.		Seals.		Seals.
1825	5,500	1829	2,468	1833	1,360	1837	700
1826	4,400	1830	2,160	1834	1,190	1838	580
1827	3,520	1831	1,890	1835	1,040	1839	500
1828	2,816	1832	1,554	1836	850	1840	400

RESULTS OF THE ZAPOOSKA.

(10) Following two years of zapooska (saving), the seal's life is enhanced for more than ten years, and the loss sustained by the company in the time of "zapooskov" (about 8,500) is made good in the long run. The case may be thus stated: If the company had not spared the seals in 1826–27 they would have received from 1826 to 1838 (twelve years) no more than 24,000; but by making this zapooska regulation for two years they got in ten years 31,576, and beyond this, can yet take 15,000 without another or any zapooska.

(11) And in this case, where such an insignificant number of seals was spared on St. George (about 8,500), and in such a short time (two years), the result was at once significant every year; that is, three times more appeared than the number spared. The result therefore must be large annually on the island of St. Paul, where in consequence of the last orders or directions of the governor already four years of saving have been in force, in which time over 30,000 seals have been left for breeding.

On this account and in conformity with the above I here present a table, a prophesy of the seals that are to come in the next fifteen years from 7,060 seals saved on the island of St. Paul in 1835.

On the island of St. Paul, at the direction of the governor, a zapooska (or saving) was made of 12,700 seals. That is, before the year 1834 there were killed 12,700 seals, and, on the following year, if this saving had not been made, according to the testimony of the inhabitants, no more than 12,200 seals would or could have been taken from the islands, it being thought that this number (12,200) was only one-twenty-fifth of the whole; but instead of killing 12,200 only 4,052 were taken, leaving in 1835, for breeding, 8,118 fresh young seals, males and females, together.

In making this hypothetical table of seals that are to come, I take the average killing—that is, one-eighth part—and proceed on the supposition that the number of saved seals will not be less than 7,060.

In the number of 7,060 seals we can calculate upon 3,600 females—that is, a slight majority of females. With the new females born under this zapooska, I place half of those born the first year, and so on.

Females, in the twelve or eighteen years next after their birth, must become less in number from natural causes, and by the twenty-second year of their lives they must be quite useless for breeding.

Of the number of seals which may be born during the next four years of zapooska, or longer, we may take half for females. This number is included in the table, and the males or holluschickie make up the total.

From table 2 observe that—

(1) Old females, that is, those which in 1835 were capable of bearing young, in 1850 must be canceled (minus). They probably die in proportion of one-eighth of the whole number every year

(2) For the first four years of zapooska, until the new females begin to bear their number will generally be less.

(3) A constant number of seals will continue during the first six years of their zapooska; in twelve, these seals will double; in fourteen years they will have increased threefold; and after fifteen years of this zapooska, or saving of 7,000 in the first year, 24,000 may be taken from them; in the second, 28,000; in the third, 32,000; in the fourth, 36,000; in the fifth, 41,000. Thus in five years more than 160,000 can be taken. Then, under the supervision of persons who will see that one-fifth of the seals be steadily spared, 32,000 may be taken every year for a long time.

(4) Moreover, from the production of fifteen years' zapooska there can be taken from 60,000 to 70,000 holluschickie, which, together with 160,000 seals, makes 230,000.

(5) If this zapooska for the next fifteen years is not made for the seal's life, diminution will certainly ensue, and all this time, with all possible effort, no more than 50,000 seals will be taken.

Here it should be said that this hypothetical table of the probable increase of seals is made on the supposition of the decrease of females, and an average is taken accordingly. Furthermore, on the island of St. Paul, in 1836–37, instead of 7,900 seals being killed but 4,860 were taken. Hence it follows that these 1,500 females thus saved in two years, and which are omitted from the table, will also make a very significant addition to the incoming seals.[1]

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[1] The reader in following the calculations of the bishop, as exhibited by this table, must not forget to bear in mind as he runs it over that it is arranged with a sliding scale of increase that counts steadily down from 1840 to 1849, and also a sliding-down scale of decrease by reason of natural death rates that works steadily across these figures of increase just specified.

I made this translation at Oonalashka, in the house of the Rev. Innokenty Shaishnekov, a son of that Shaieshnikov which the bishop quotes on p. 131, *ante*. I took great care to preserve the exact English equivalent of the bishop's Russian text, and was aided very much by the Creole priest, who had that copy of Veniaminov's *Zapieska* in his possession, which I used.

"Deacon" Kazean Shaishnekov, the father of the Oonalashka priest, was the agent in charge of this island of St. Paul for the old Russian company from 1828 or 1829 up to 1854, when he died. He left a copious and carefully written diary, covering everything that transpired daily on the seal islands during all that period. A stupid and unworthy relative *actually took this precious MS. and had pasted it all over the doors, the walls, and the ceiling of his house on the island in 1860–1864*, and I saw a few of the smoke-stained sheets still sticking there in 1872. This is a species of vandalism that beggars adequate description.—H. W. E.

TABLE 2.—*Showing the number of seals that will visit the island in the next twenty-two (1835–1856, inclusive) years (a prophecy made by Veniaminov in 1834).*

Years.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.
1835	3,600	0	0	0	0	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,000	800	400	200	.....	.....	.....
1836	0	3,150	0	.....	.....	.....	785	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,000	700	300	100	.....	.....
1837	.....	0	2,755	.....	.....	.....	.....	680	918	918	918	918	918	918	918	918	918	900	600	300	10	.....
1838	.....	.....	.....	2,410	.....	.....	.....	.....	600	805	805	805	805	805	805	805	805	805	805	750	500	300
1839	.....	.....	.....	.....	2,110	.....	.....	.....	.....	450	700	700	700	700	700	700	700	700	700	700	600	400
1840	.....	.....	.....	.....	.....	1,845	.....	From old arrivals.			450	615	615	615	615	615	615	615	615	615	600	500
					New.	900	.....	From newcomers.			152	200	200	200	200	200	200	200	200	200	150	100
1841	.....	.....	.....	.....	.....	.....	1,580	.....	.....	.....	.....	315	525	525	525	525	525	525	525	525	525	500
					Total new.		1,985	.....	From new ones.			420	572	572	572	572	572	572	572	572	572	500
1842	.....	.....	.....	.....	.....	.....	.....	1,355	.....	.....	.....	.....	325	451	451	451	451	451	451	451	451	451
						Total new.		2,930	.....	From new ones.			650	909	909	909	909	909	909	909	909	909
1843	.....	.....	.....	.....	.....	.....	.....	.....	1,130	.....	.....	.....	.....	258	376	376	376	376	376	376	376	376
							Total new.		3,768	.....	From new ones.			880	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188
1844	.....	.....	.....	.....	.....	.....	.....	.....	.....	900	.....	.....	.....	.....	225	300	300	300	300	300	300	300
								Total new.		4,423	.....	From new ones.			1,020	1,440	1,440	1,440	1,440	1,440	1,440	1,440
1845	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	725	.....	.....	.....	.....	180	241	241	241	241	241	241
									Total new.		5,275	.....	From new ones.			1,240	1,687	1,687	1,687	1,687	1,687	1,687
1846	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	580	.....	.....	.....	.....	125	190	190	190	190	190
										Total new.		6,225	.....	From new ones.			1,500	1,994	1,994	1,994	1,994	1,994
1847	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	430	.....	.....	.....	.....	100	143	143	143	143
											Total new.		7,560	.....	From new ones.			1,810	2,420	2,420	2,420	2,420
1848	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250	.....	.....	.....	.....	61	83	83	83
												Total new.		9,083	.....	From new ones.			2,254	2,908	2,908	2,908
1849	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....	.....	.....	.....	25	40	40
													Total new.		10,654	.....	.....	.....	.....	2,550	3,187	3,187
Total females	3,600	3,150	2,755	2,410	2,110	2,745	3,565	4,285	4,898	5,323	6,000	6,805	7,990	9,333	10,754	12,369	14,153	16,148	18,216	20,820	20,105	19,358
Total males	3,460	3,150	2,755	2,410	2,110	2,745	3,435	4,215	4,102	5,378	6,000	6,795	8,010	9,267	10,746	12,331	14,147	16,102	18,184	20,824	20,095	19,342
All	7,060	6,300	5,510	4,820	4,220	5,490	7,000	8,500	9,700	10,700	12,000	13,600	16,000	18,600	21,500	24,700	28,300	32,250	36,400	41,644	40,200	38,700

From this table behold that—

(*a*) Every fifteen years from 3,600 females there can be received in sixteen years 24,700 seals; in sixteen years still more, and in twenty years 41,640.

(*b*) In the twenty-first year the incomes begin to diminish, provided that if in the meantime, or the following sixteen years, a certain number of young seals are not left to breed; and if every year a known number are left to breed, then in all following years the yield will never be less than 20,000 every year.

The foregoing chapter of Bishop Veniaminov was written in 1837, and closes his knowledge of the topic with that year. The "zapooska" of 1834, which stopped all killing except a few food seals for the natives in the seasons of 1835–1840, ran on in the following manner for St. Paul Island, until the restoration of the rookeries in 1846–1850. This is the only record extant, and I was fortunate in getting it.

Proeezvodaytra Pooshnik Promissloo vie e droogich, sah 1835 goda zapooska. (*List of the killing for furs and other purposes since the zapooska of 1835.*)[1]

Year.	Bachelor skins (fur seals).	Pup skins (fur seals, gray).	Year.	Bachelor skins (fur seals).	Pup skins (fur seals, gray).
1835	100	3,952	1845	9,550	3,428
1836	1,200	2,840	1846	12,000	3,503
1837	2,000	2,020	1847	13,300	3,708
1838	2,560	1,380	1848	13,600	3,370
1839	5,000	230	1849	10,000	3,350
1840	5,350	650	1850	5,530	538
1841	7,100	900	1851	10,295	935
1842	8,800	1,260	1852	9,380	1,250
1843	10,050	1,294	1853	13,996	1,700
1844	10,150	2,632	1854	33,861	1,400

[1] This list above quoted, is a record kept by the Rev. Kazean Shaishnikov, who lived on St. Paul Island throughout the period covered by it. The autographic original was given to me to copy by his son, Father Paul Shaishnikov, and Kerick Artamanov, who had it in their possession on the 2d of July, 1890. No similar writing exists for the same period on the island of St. George.

Now, with this list in hand, the following table 1 of Bishop Veniaminov becomes intelligible. Without it, I have hitherto been unable to reconcile his statement that all killing was stopped in 1835, on the one hand, and on the other, with the figures which he gives below for 1835, and up to the end of his record in 1837; but, on turning to Shaishnikov's item for that year, we see that the bishop's total of "4,052" as taken that year on St. Paul really was only "*100 skins of bachelor fur seals*" and "*3,952 skins of pups*"— "*gray*" *pups, or 5-month-old's*, having by that time shed their black natal coats and donned their gray overhair seagoing jackets. Thus we observe that the killing for market, was literally stopped. The pups were taken by the natives for food and clothing.

TABLE 1, PART 2.—*Bishop Veniaminov's Zapieska, etc., showing the seal catch during the period of gradual diminution of life on the islands from 1817 down to 1837.*

Year.	Taken from—			Year.	Taken from—		
	St. Paul Island.	St. George Island.	Total.		St. Paul Island.	St. George Island.	Total.
1817	47,860	12,328	60,188	1829	17,150	3,661	20,811
1818	45,932	13,924	59,856	1830	15,200	2,834	18,034
1819	40,300	11,925	52,225	1831	12,950	3,084	16,034
1820	39,700	10,520	50,220	1832	13,150	3,296	16,446
1821	35,750	9,245	44,995	1833	13,200	3,212	16,412
1822	28,150	8,319	36,469	1834	12,700	3,051	15,751
1823	24,100	5,773	29,873	1835	4,052	2,528	6,580
1824	19,850	5,550	25,400	1836	4,040	2,550	6,590
1825	24,600	5,500	30,100	1837	4,220	2,582	6,802
1826	23,250	.....	23,250				
1827	17,750	1,950	19,700	Total	464,259	114,665	578,924
1828	18,450	4,778	23,228				

It should be borne in mind as this table 1 is scanned, that during all this time, from 1817 down to 1834, all sorts of "halfway measures" were being tried without success by the Russian-American Company so as to try and save the seal life, and yet at the same time, continue a modified annual killing for shipment. They finally concluded, in 1834, as a result of a "half measure" of saving, they ought to get at least 20,000 to 25,000 skins of 1 and 2 year olds (taking them just as they came, for that matter); but after "all possible exertion," only 12,700 skins were secured, and the natives declared the ruin of these rookeries at hand if another such a season of driving and killing was inaugurated. The company then reluctantly but wisely ordered that cessation of sealing which Shaishnikov's list testifies to.

A study of this killing throughout the "zapooska" of 1834, on St. Paul Island, shows that for a period of seven years, from 1835 down to the close of the season of 1841, no seals practically were killed save those that were needed for food and clothing by the natives; *and that in 1835, for the first time in the history of this industry on these islands, was the vital principle of not killing female seals recognized.* It will be noticed that the entry for each and every year distinctly specifies so many "bachelor seals," or "holluschickov kotovie" ("*Холостиков Котовихъ*"). The sealing, in those early days, was carried on all through the summer, until the seals left in October or November, on account of the tedious method, then in vogue, of air-drying the skins. This protracted driving, after the breaking up of the breeding season by the end of July, caused them to take up at first, hundreds, and thousands later on, of the females in the same manner that they have been driven up during the last two seasons of 1889 and 1890; but they never spared those cows then, when they arrived in the droves on the killing grounds prior to this date, above quoted, of 1835.

In 1842–43 it will be observed that the killing is advanced to a total of 9,000 and 10,000 skins for these years, respectively: and, until 1854, this killing was not greatly increased per annum; then it was suddenly put up to 33,000 bachelor seals: and in 1857, the old natives assured me last summer, there were as many seals on the islands then, as there were when I recorded their area and position during 1872–1874: and, that from the year 1854, the Russian Company never had any more concern as to the supply of killable seals on the Pribilov Islands. They got annually thereafter all that was ordered taken each season.

While the supply of killable seals in 1890 was not near so low as that of 1834, yet it was really as bad—worse, perhaps, when the calculations of the old and new companies for the season's catch are taken into account, and *with reference to next year, far worse, because the additional danger and source of injury from pelagic sealing is added to the cause for present declination of the rookeries. It did not enter into Russian calculations:* the seals of Bering Sea were never seriously disturbed by these hunters until 1886.

The condition of the Pribilov rookeries to-day is such as to make the following imperative demands upon our Government, if they are to be saved, as they should be, from speedy ruin:

First. That no young male seals whatsoever shall be killed on these islands as a source of revenue, either to the public Treasury or to private corporations, for the next seven years, i. e., during the seasons of 1891–1898, inclusive.

This step is imperative: there was scarcely a drop of young male blood in service on the breeding grounds of either St. Paul or St. George throughout the reproductive season of 1890. There are no young bulls

left to speak of, on these hauling grounds, above the 1 and 2 year old grades—very few of the latter, and not many of the former. It will take at least five years of perfect rest for the scanty stock now left of this character in which to mature so as to serve on these breeding grounds; and it will be two years after this new service is first rendered before the appreciable gain can be well seen: and, in this necessary period of five years' growth not more than one-half of these young bulls thus maturing can be estimated as certain to survive the attacks of their natural enemies at sea—sharks, killer whales, etc.

Second. That all pelagic sealing in the waters of Bering Sea be prohibited and suppressed throughout the breeding season—no matter how, so that it is done, and done quickly.

This step is equally imperative. The immorality of that demand made by the open-water sealer to ruin within a few short years and destroy forever these fur-bearing interests on the Pribilov Islands—the immorality of this demand can not be glossed over by any sophistry. The idea of permitting such a chase to continue where 5,000 female seals,[1] heavy with their unborn young, or busy with nursing offspring, are killed in order to secure every 1,500 skins taken, is repugnant to the sense of decency and the simplest instincts of true manhood! I can not refrain from expressing my firm belief that if the truth is known, made plain to responsible heads of the civilized powers of the world, that not one of these Governments will hesitate to unite with ours in closing Bering Sea and the Pacific passes of the Aleutian Chain to any and all pelagic fur sealing during the breeding season of that animal.

If these two steps are taken next year, and a perfect rest established throughout the breeding seasons on the islands, and in the waters of Bering Sea, for the next seven years, inclusive, then the restoration of these sadly diminished interests to their good form of 1872–1874 will have been well advanced, if not wholly realized by the expiration of the season of 1898.

Then, with revised and proper regulations for driving and killing, the twentieth century may open with another era of commercial prosperity for these islands: with pleasure and profit for those of us not only at home, but all over the world where fine furs are worn and valued.

In taking these two steps the Government can not divide the responsibility; it must assume the entire order and conduct of affairs on these seal islands of Alaska for the next seven years. The new lessees of 1890 should have a fair rebate. They are not to blame in any sense whatsoever, for the present condition of the rookeries and hauling grounds; not at all. They can not be asked to nurse these shriveled rookeries into shape: to feed and clothe the natives, and maintain an establishment on these islands for that purpose during this necessary period of rest; and if they offered to do it, this offer, for obvious reasons, should be refused.

The skins of a few thousand yearlings and pups which the natives may safely kill under order of the Secretary of the Treasury every year for food and clothing, just as they killed them in 1834–1843, inclusive, will, when sold by the Secretary of the Treasury, fully meet all the cost of caring for these dependent people properly, and enable them to live

[1] Killing a pregnant female seal in 1890 destroys not only her life, but also that of her unborn young, and *that new intra uterine life which will at once follow this birth*, on the Pribilov rookery to be born in 1891—*thus destroying three lives*—three seals at one indecent stroke! Granted, for sake of argument, that the pelagic sealer gets every pregnant female seal, or nursing mother seal, that he strikes in the water—that he does not lose one—*does he not make the shameful showing of having killed some 5,000 seals to get 1,500?* Where is his escape from this brand of indecent butchery! He has none.

just as comfortably as they have been living. These food skins can be annually brought down to market on the revenue cutters, and these vessels can bring up the supplies of food, fuel, and clothing necessary for the natives after their purchase in due form by the Treasury Department.

The new lessees of 1890 in full belief, and warranted by official reports in believing, that they would get at least 60,000 prime skins in the first season and annually more thereafter, during the period of their contract, purchased the entire land plant of the old lessees, i. e., the salt houses, dwelling and school houses, barns, stores and goods, and divers chattels, and paid for it—together with the 81 small dwelling houses which the old company built for the natives' occupation—about $65,000.[1] Those people have lived in these cottages, rent free, during the last eighteen years: and do live in them now under the same privilege, repairs and paint being also furnished gratis.

Under the present changed order of affairs the Government needs at once part of this plant above cited at least, and, for that matter, should not hesitate to take it entirely off the hands of the new lessees as the condition of the business now stands; also the money paid on account of the native houses should be promptly refunded by the Government to the new lessees: for, as I have said, there can not be any division of responsibility in the coming change of nursing these exhausted rookeries back to good order. The work has got to be entirely free from any and all suspicion of private intrigue and gain during the next seven years, or it had better not be undertaken. This will require the removal of everybody from these islands except the natives and the Government officers and employees. These resident men should consist of the existing staff of four Treasury agents, a physician for each island, and a school teacher and storekeeper also, in each village, including a mess cook, and laundryman.

On account of the remoteness of their situation, those officers and employees of the Government should be housed on these islands and supplied with rations and fuel free of cost to themselves: otherwise the enforced abnormal expense of living there would render their salaries absurdly inadequate. These supplies can be regularly purchased in San Francisco, every spring by the collector of customs of that port and sent up to the seal islands on the revenue cutters which annually have cruised and will cruise around about them throughout each coming season.[2]

While the Secretary of the Treasury is fully empowered by existing law, I believe, to take any or all steps necessary to preserve and protect these interests of the Government on the seal islands of Alaska, yet the passage of a bill substantially like the following draft will save him from some misunderstanding and doubt in the minds of our people as to the precise limit of his authority. He also needs the authority of law for the establishment of the school teachers, physicians, etc.

SUGGESTION FOR—

A BILL for the protection and preservation of the interests of the Government on the fur-seal islands of Alaska, Pribilov group, Bering Sea, Alaska.

Be it enacted, etc.

SECTION 1. That for the period of seven years from and after the passage of this act no fur seals shall be killed for their skins on or around the fur-seal islands (Pribilov group) of Alaska by any person or persons whatsoever: *Provided*, That the natives of

[1] See p. 225, Appendix.

[2] It is wholly unnecessary to enter into the details of this programme; they will all suggest themselves in due form to the officers of the Treasury Department and be promptly attended to when the work is undertaken.

said islands shall have the privilege of killing such young male seals only as may be required for their food and clothing and the construction of their small boats for their own use, which killing shall be limited and controlled by the Secretary of the Treasury, as he may prescribe: and he is hereby authorized to incur any and all proper and necessary expenses incident to the establishment, and maintenance and employment of one physician, one school teacher, one storekeeper, and one cook on each island: also for the proper housing of the natives, the Government officers in charge, and property, with rations for the same, and fuel, throughout the time specified in the foregoing section: *Provided, also,* That such food skins taken as above cited shall be sold annually for the defrayment in part, or in whole, of these expenses, at public auction, by the Secretary of the Treasury. Said food skins to be classified for such sale by the Treasury agent in charge, and accompanied by him from the islands until sold, as prescribed by the Secretary of the Treasury.

SEC. 2. *And be it further enacted, etc.* That no persons other than the natives and the authorized agents of the Government shall be permitted to occupy said islands, or either of them, from and after the passage of this act; and any person or persons who may attempt or attempts to violate this order of this section, or that of the first section of this act, shall be punished on conviction thereof for each offense by a fine of not less than $1,000 or more than $10,000, or by imprisonment not exceeding one year, or by both such fine and imprisonment, at the discretion of the court having jurisdiction and taking cognizance of the offenses; and all vessels, their tackle, apparel, and furniture, whose crew shall be found engaged in the violation of any of the provisions of this act, shall be forfeited to the United States.

SEC. 3. *And be it further enacted, etc.* That the provisions of the seventh and eighth sections of an act entitled "An act to extend the laws of the United States relating to customs, commerce, and navigation over the territory ceded to the United States by Russia, to establish a collection district therein, and for other purposes," approved July 27, 1868, shall be deemed to apply to this act; and all prosecution for offenses committed against the provisions of this act, and all other proceedings had because of the violation of the provisions of this act, and which are authorized by the said act above specified, shall be in accordance with the provisions thereof, and all acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

The existing law reads as below:

AN ACT to prevent the extermination of fur-bearing animals in Alaska.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful to kill any fur seal upon the islands of St. Paul and St. George, or in the waters adjacent thereto, except during the months of June, July, September, and October in each year, and it shall be unlawful to kill such seals at any time by the use of firearms, or the use of other means tending to drive the seals away from said islands: *Provided,* That the natives of said islands shall have the privilege of killing such young seals as may be necessary for their own food and clothing during other months, and also such old seals as may be required for their own clothing and for the manufacture of boats for their own use, which killing shall be limited and controlled by such regulations as shall be prescribed by the Secretary of the Treasury.

SEC. 2. *And be it further enacted,* That it shall be unlawful to kill any female seal, or any seal less than one year old, at any season of the year except as above provided; and it shall also be unlawful to kill any seal in the waters adjacent to said islands, or on the beaches, cliffs, or rocks where they haul up from the sea to remain; and any person who shall violate either of the provisions of this or the first section of this act shall be punished on conviction thereof, for each offense, by a fine of not less than two hundred dollars nor more than one thousand dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment, at the discretion of the court having jurisdiction and taking cognizance of the offenses; and all vessels, their tackle, apparel, and furniture, whose crew shall be found engaged in the violation of any of the provisions of this act, shall be forfeited to the United States.

SEC. 3. *And be it further enacted,* That for the period of twenty years from and after the passage of this act, the number of fur seals which may be killed for their skins upon the island of St. Paul is hereby limited and restricted to seventy-five thousand per annum; and the number of fur seals which may be killed for their skins upon the island of St. George is hereby limited and restricted to twenty-five thousand per annum: *Provided,* That the Secretary of the Treasury may restrict and limit the right of killing, if it shall become necessary for the preservation of such seals, with such proportionate reduction of rents reserved to the Government as shall be right and proper; and if any person shall knowingly violate either of the provisions of this section, he shall, upon due conviction thereof, be punished in the same way as is provided herein for a violation of the provisions of the first and second sections of this act.

SEC. 4. *And be it further enacted*, That immediately after the passage of this act the Secretary of the Treasury shall lease, for the rental mentioned in section 6 of this act, to proper and responsible parties, to the best advantage of the United States, having due regard to the interests of the Government, the native inhabitants, the parties heretofore engaged in the trade, and the protection of the seal fisheries, for a term of twenty years from the first day of May, eighteen hundred and seventy, the right to engage in the business of taking fur seals on the islands of St. Paul and St. George, and to send a vessel or vessels to said islands for the skins of such seals, giving to the lessee or lessees of said islands a lease duly executed, in duplicate, not transferable, and taking from the lessee or lessees of said islands a bond, with sufficient sureties, in a sum not less than five hundred thousand dollars, conditioned for the faithful observance of all the laws and requirements of Congress and of the regulations of the Secretary of the Treasury touching the subject-matter of taking fur seals and disposing of the same and for the payment of all taxes and dues accruing to the United States connected therewith. And in making said lease the Secretary of the Treasury shall have due regard to the preservation of the seal-fur trade of the islands and the comfort, maintenance, and education of the natives thereof. The said lessees shall furnish to the several masters of vessels employed by them certified copies of the lease held by them, respectively, which shall be presented to the Government revenue officer for the time being who may be in charge at the said islands as the authority of the party for landing and taking skins.

SEC. 5. *And be it further enacted*, That at the expiration of said term of twenty years, or on surrender or forfeiture of any lease, other leases may be made in manner as aforesaid for other terms of twenty years; but no person other than American citizens shall be permitted, by lease or otherwise, to occupy said islands, or either of them, for the purpose of taking the skins of fur seals therefrom, nor shall any foreign vessel be engaged in taking such skins; and the Secretary of the Treasury shall vacate and declare any lease forfeited if the same be held or operated for the use, benefit, or advantage, directly or indirectly, of any person or persons other than American citizens. Every lease shall contain a covenant on the part of the lessee that he will not keep, sell, furnish, give, or dispose of any distilled spirits or spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine; and any person who shall kill any fur seal on either of said islands, or in the waters adjacent thereto (excepting natives as provided by this act), without authority of the lessees thereof, and any person who shall molest, disturb, or interfere with said lessees, or either of them, or their agents or employees, in the lawful prosecution of their business under the provisions of this act, shall be deemed guilty of a misdemeanor, and shall for each offense, on conviction thereof, be punished in the same way and by like penalties as prescribed in the second section of this act; and all vessels, their tackle, apparel, appurtenances, and cargo, whose crews shall be found engaged in any violation of either of the provisions of this section, shall be forfeited to the United States; and if any person or company, under any lease herein authorized, shall knowingly kill, or permit to be killed, any number of seals exceeding the number for each island in this act prescribed, such person or company shall, in addition to the penalties and forfeitures aforesaid, also forfeit the whole number of skins of seals killed in that year, or, in case the same have been disposed of, then said person or company shall forfeit the value of the same. And it shall be the duty of any revenue officer, officially acting as such on either of said islands, to seize and destroy any distilled spirits or spirituous liquors found thereon: *Provided*, That such officer shall make detailed report of his doings to the collector of the port.

SEC. 6. *And be it further enacted*, That the annual rental to be reserved by said lease shall be not less than fifty thousand dollars per annum, to be secured by deposit of United States bonds to that amount, and in addition thereto a revenue tax or duty of two dollars is hereby laid upon each fur seal skin taken and shipped from said islands during the continuance of such lease, to be paid into the Treasury of the United States; and the Secretary of the Treasury is hereby empowered and authorized to make all needful rules and regulations for the collection and payment of the same; and to secure the comfort, maintenance, education, and protection of the natives of said islands, and also for carrying into full effect all the provisions of this act: *Provided*, That the Secretary of the Treasury may terminate any lease given to any person, company, or corporation, on full and satisfactory proof of the violation of any of the provisions of this act, or rules and regulations established by him.

SEC. 7. *And be it further enacted*, That the provisions of the seventh and eighth sections of an act entitled "An act to extend the laws of the United States relating to customs, commerce, and navigation over the territory ceded to the United States by Russia, to establish a collection district therein, and for other purposes," approved July 27, 1868, shall be deemed to apply to this act; and all prosecution for offenses committed against the provisions of this act, and all other proceedings had because of the violations of the provisions of this act, and which are authorized by said act

above mentioned, shall be in accordance with the provisions thereof, and all acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 8. *And be it further enacted*, That the Congress may at any time hereafter alter, amend, or repeal this act.

Approved July 1, 1870.

[Amended March 24, 1874.]

Be it enacted, etc., That an act entitled "An act to prevent the extermination of fur-bearing animals in Alaska," approved July first, eighteen hundred and seventy, is hereby amended so as to authorize the Secretary of the Treasury, and he is hereby authorized, to designate the mouths in which the fur seals may be taken for their skins on the islands of St. Paul and St. George, in Alaska, and in the waters adjacent thereto, and the number to be taken on or about each island respectively.

In pursuance of this act of July 1, 1870, on the 3d of August 1870, the Secretary of the Treasury executed the following lease:

TERMS OF THE SEAL-ISLAND LEASE FROM THE GOVERNMENT.

This indenture in duplicate, made this 3d day of August, A. D., 1870, by and between William A. Richardson, Acting Secretary of the Treasury, in pursuance of an act of Congress approved July 1, 1870, entitled "An act to prevent the extermination of fur-bearing animals in Alaska," and the Alaska Commercial Company, a corporation duly established under the laws of the State of California, acting by John F. Miller, its president and agent, in accordance with a resolution at a meeting of its board of trustees, held January 31, 1870, witnesseth:

That said Secretary hereby leases to the said Alaska Commercial Company, without power of transfer, for the term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur seals on the islands of St. George and St. Paul within the territory of Alaska, and to send a vessel or vessels to said islands for the skins of such seals.

And the said Alaska Commercial Company, in consideration of their right under this lease, hereby covenant and agree to pay for each year during said term and in proportion during any part thereof, the sum of $55,000 into the Treasury of the United States in accordance with the regulations of the Secretary to be made for this purpose under said act, which payment shall be secured by deposit of United States bonds to that amount, and also covenant and agree to pay annually into the Treasury of the United States, under said rules and regulations, an internal-revenue tax or duty of $2 for each seal skin taken and shipped by them in accordance with the provisions of the act aforesaid, and also the sum of 60½ cents for each fur-seal skin taken and shipped, and 55 cents per gallon for each gallon of oil obtained from said seals, for sale in said islands or elsewhere, and sold by said company; and also covenant and agree, in accordance with said rules and regulations, to furnish, free of charge, the inhabitants of the islands of St. Paul and St. George annually during said term 25,000 dried salmon, 60 cords firewood, and a sufficient quantity of salt and a sufficient quantity of barrels for preserving the necessary supply of meat.

And the said lessees also hereby covenant and agree during the term aforesaid to maintain a school on each island, in accordance with said rules and regulations and suitable for the education of the natives of said islands, for a period of not less than eight months in each year.

And the said lessees further covenant and agree not to kill upon said island of St. Paul more than 75,000 fur seals, and upon the island of St. George not more than 25,000 fur seals per annum; not to kill any fur seal upon the islands aforesaid in any other month except the months of June, July, September, and October of each year; not to kill said seals at any time by the use of firearms or means tending to drive said seals from said islands; not to kill any female seals or seals under one year old; not to kill any seal in waters adjacent to said islands, or on the beach, cliffs, or rocks, where they haul up from the sea to remain.

And the said lessees further covenant and agree to abide by any restriction or limitation upon the right to kill seals under this lease that the act prescribes, or that the Secretary of the Treasury shall judge necessary for the preservation of such seals.

And the said lessees hereby agree that they will not in any way sell, transfer, or assign this lease, and that any transfer, sale, or assignment of the same shall be void and of no effect.

And the said lessees further agree to furnish to the several masters of the vessels employed by them certified copies of this lease, to be presented to the Government revenue officers for the time being in charge of said islands, as the authority of said lessees for the landing and taking of said skins.

And the said lessees further covenant and agree that they or their agents shall not keep, sell, furnish, give, or dispose of any distilled spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine.

And the said lessees further covenant and agree that this lease is accepted, subject to all needful rules and regulations which shall at any time or times hereafter be made by the Secretary of the Treasury for the collection and payment of the rental herein agreed to be paid by said lessees for the comfort, maintenance, education, and protection of the natives of said islands, and for carrying into effect all the provisions of the act aforesaid, and will abide by and conform to said rules and regulations.

And the said lessees, accepting this lease with a full knowledge of the provisions of the aforesaid act of Congress, further covenant and agree that they will fulfill all the provisions, requirements, and limitations of said act, whether herein specifically set out or not.

In witness whereof the parties aforesaid have hereunto set their hands and seals the day and year above written.

WILLIAM A. RICHARDSON, [SEAL.]
Acting Secretary of the Treasury.

ALASKA COMMERCIAL COMPANY,
By JOHN F. MILLER, *President.* [SEAL.]

Executed in presence of—
J. H. SAVILLE.

This lease having terminated on the 1st day of last May (1890), the following new lease was executed in accordance with the law:

This indenture, made in duplicate this 12th day of March, 1890, by and between William Windom, Secretary of the Treasury of the United States, in pursuance of chapter 3 of title 23, Revised Statutes, and the North American Commercial Company, a corporation duly established under the laws of the State of California, and acting by I. Liebes, its president, in accordance with a resolution of said corporation adopted at a meeting of its board of directors held January 4, 1890:

Witnesseth, that the said Secretary of the Treasury, in consideration of the agreements hereinafter stated, hereby leases to the said North American Commercial Company, for a term of twenty years from the 1st day of May, 1890, the exclusive right to engage in the business of taking fur seals on the islands of St. George and St. Paul, in the Territory of Alaska, and to send a vessel or vessels to said islands for the skins of such seals.

The said North American Commercial Company, in consideration of the rights secured to it under this lease above stated, on its part covenants and agrees to do the things following, that is to say:

To pay to the Treasurer of the United States each year during the said term of twenty years, as annual rental, the sum of $60,000, and in addition thereto agrees to pay the revenue tax or duty of $2 laid upon each fur-seal skin taken and shipped by it from said islands of St. George and St. Paul; and also to pay to said Treasurer the further sum of $7.62½ apiece for each and every fur skin taken and shipped from said islands; and also to pay the sum of 50 cents per gallon for each gallon of oil sold by it made from seals that may be taken on said islands during the said period of twenty years; and to secure the prompt payment of the $60,000 rental above referred to, the said company agrees to deposit with the Secretary of the Treasury bonds of the United States to the amount of $50,000, face value, to be held as a guaranty for the annual payment of said $60,000 rental, the interest thereon when due to be collected and paid to the North American Commercial Company, provided the said company is not in default of payment of any part of the said $60,000 rental.

That it will furnish to the native inhabitants of said islands of St. George and St. Paul annually such quantity or number of dried salmon and such quantity of salt, and such number of salt barrels for preserving their necessary supply of meat as the Secretary of the Treasury shall from time to time determine.

That it will also furnish to the said inhabitants 80 tons of coal annually, and a sufficient number of comfortable dwellings in which said native inhabitants may reside; and will keep said dwellings in proper repair, and will also provide and keep in repair such suitable schoolhouses as may be necessary, and will establish and maintain during eight months of each year proper schools for the education of the children on said islands, the same to be taught by competent teachers who shall be paid by the company a fair compensation, all to the satisfaction of the Secretary of the Treasury; and will also provide and maintain a suitable house for religious worship; and will also provide a competent physician or physicians, and necessary and proper medicines and medical supplies; and will also provide the necessaries of life for the widows and orphans and aged and infirm inhabitants of said islands who are unable

to provide for themselves; all of which foregoing agreements will be done and performed by the said company free of all costs and charges to said native inhabitants of said islands or to the United States.

The annual rental, together with all other payments to the United States provided for in this lease, shall be made and paid on or before the 1st day of April of each and every year during the existence of this lease, beginning with the 1st day of April, 1891.

The said company further agrees to employ the native inhabitants of said islands to perform such labor upon the islands as they are fitted to perform, and to pay therefor a fair and just compensation, such as may be fixed by the Secretary of the Treasury, and also to contribute, as far as is in its power, all reasonable efforts to secure the comfort, health, education, and promote the morals and civilization of said native inhabitants.

The said company also agrees faithfully to obey and abide by all rules and regulations that the Secretary of the Treasury has heretofore or may hereafter establish or make in pursuance of law concerning the taking of seals of said islands, and concerning the comfort, morals, and other interests of said inhabitants, and all matters pertaining to said islands and the taking of seals within the possession of the United States. It also agrees to obey and abide by any restrictions or limitations upon the right to kill seals that the Secretary of the Treasury shall judge necessary, under the law, for the preservation of the seal fisheries of the United States; and it agrees that it will not kill or permit to be killed, so far as it can prevent, in any year a greater number of seals than is authorized by the Secretary of the Treasury.

The said company further agrees that it will not permit any of its agents to keep, sell, give, or dispose of any distilled spirits or spirituous liquors or opium, on either of said islands, or the waters adjacent thereto, to any of the native inhabitants of said islands, such person not being a physician and furnishing the same for use as a medicine.

It is understood and agreed that the number of fur seals to be taken and killed for their skins upon said islands by the North American Commercial Company during the year ending May 1, 1891, shall not exceed 60,000.

The Secretary of the Treasury reserves the right to terminate this lease and all rights of the North American Commercial Company under the same at any time, on full and satisfactory proof that the said company has violated any of the provisions and agreements of this lease, or any of the laws of the United States, or any Treasury regulation respecting the taking of fur seals, or concerning the islands of St. George and St. Paul, or the inhabitants thereof.

In witness whereof the parties have set their hands and seals the day and year above written.

[SEAL.] WILLIAM WINDOM, *Secretary of the Treasury.*

[SEAL.] NORTH AMERICAN COMMERCIAL COMPANY.
By I. LIEBES,
President of the North American Commercial Company.

Attest:
H. B. PARSONS, *Assistant Secretary.*

In both of these instruments it will be observed that the old and the new lessees emphatically and unreservedly "*agree to abide by any restriction or limitation upon the right to kill seals under the lease that the act prescribes or that the Secretary of the Treasury shall judge necessary for the preservation of such seals.*"

Had there been any refusal on the part of the lessees to thus covenant and agree in this important regard, no seal island lease could ever have been sustained by its friends. The powerful and jealous opponents of this system would have carried the day in 1870 and again in 1890.

The wisdom and propriety of this express reservation in behalf of the Government, is now apparent; there is no legal or moral obstacle in the way of taking the action which I suggest for the restoration of these interests on the seal islands themselves: and, I firmly believe that a visit by some representative commission of Great Britain to these Pribilov rookeries next season will result in securing the prompt, hearty cooperation of that power with our Government in protecting these seals from slaughter in the open waters of Bering Sea, *and certain portions of the North Pacific Ocean*, during the breeding season of those animals.

SECTION VIII.

APPENDIX, CONTAINING THE AUTHOR'S DAILY FIELD NOTES, TOGETHER WITH OTHER MEMORANDA ILLUSTRATIVE OF THE PRECEDING SECTIONS, I TO VIII, INCLUSIVE.

I give *in extenso* the following field notes, because each one belongs to a particular place, day, and date for every sealing season that is to follow this one just ended, 1890. These notes in hand on the islands during the coming years, will aid the officers of the Government up there to observe and contrast the condition of the rookeries and hauling grounds as it shall change for better or worse hereafter.

For convenience and easy reference, I divide my notes into three subdivisions, i. e., "Rookery notes," "Hauling-ground notes," and "Notes on the driving and killing," together with a following of general memoranda.

ROOKERY NOTES—ST. PAUL ISLAND, 1890.

THE REEF AND GARBOTCH.

Thursday, May 22, 1890.—Spent the day in taking a fresh set of angles over this fine area of breeding ground. The sand has drifted very slightly from its boundaries on Zoltoi during the last eighteen years: but a large field of basaltic rocks has been uncovered by the holluschickie just wearing away the grassy covering, which opens the sand to the full play of the wind, and away it goes, down to the rocky foundations. The Reef Point from Gull Hill down to the extreme southwestern "drop" of Garbotch, is a solid lava table, with bubbles of hot eruption at later intervals, all pushed up from the sea. Then from Old John Rock down to the slopes of Parade Pinnacle is a thick superstratum of volcanic cinders, all reddish and fine, polished and smoothed by 1872, into that remarkable parade ground which I have platted carefully as it lies. Below Fox Cliff, strewn from the beginning of the Reef rookery, is a surface profusion of basaltic bowlders, all knee and waist high, as a rule, though many of them are nearly sunken. This covering is characteristic of the entire Reef rookery and of Garbotch as far down as the intersection of the first point of rocks on that ridge southwest. But that northern slope of Garbotch is as smooth as a floor; a hard, cinder pavement that slopes down gently, yet rapidly, with its broad expanse to the sea. It looks as though it might have been graded by the hand of man. In the bight of this rookery and in the rocks awash at its point, 25 or 50 hair seals, *Phoca vitulina*, were basking, lulled into a sense of security by the hauling fur-seal bulls.

The whole of the Reef Point, south of Grassy Summit and Fox Cliff, was entirely bare of grass or any vegetation except lichens on rocks inaccessible to fur seals, and tufts of grass only grew on the points and cliff edges of the west shore. Tufts of grass and a few flowers appeared also over the "second drop." It looks to-day as though much vegetation had crept in and over this field since then, but it is too early now to fairly observe it.

I gathered and gave to Palmer (for the Smithsonian Institution) a lovely sample of that characteristic green confervoid growth that appears so strange to me now, as it grows upon these hauling grounds andthe rookeries. It seems to grow on the pulverized, shedded hair and fur comminuted. This makes a beautiful green carpet, and it appears to be in its best form at this time of the year; in other words, I take it to be in blossom. By the 10th to the 12th of June it shrinks and crocks up, and is not as bright as it is now.

I do not observe one bull here to-day, where I saw at least twenty at this time eighteen years ago. Then, these slopes of Garbotch were covered with angry, lusty bulls, in solid mass from the shore line to the ridge summit: so far over, even, that it required a club vigorously used before we could get up on Old John Rock, so as to look over and below. Then, they were fighting in every direction under our eyes; now, not a fight in progress anywhere; not bulls enough to quarrel. They are scattered widely over this same ground where in 1872 an interval of 10 feet between them did not exist; to-day there are intervals of hundreds of feet.

June 7, 1890.—The kelp on the submerged reef extends at least 1,000 feet to south-southwest from the rocks awash as indicated on my chart of the peninsula. This kelp marks a shoal everywhere rough and rocky within its borders, of a fathom to 6 fathoms depth, making it a very dangerous point for vessels, especially when picking up the land in a fog.

In this kelp, and over these rocks awash, the first bands of holluschickie that reach these islands every spring, sport and haul. A few of them may be seen here, at or about the arrival of the first bulls, and it is from this point that the first drives of the year are regularly made by the natives, for food, as early as the 10th to the 14th of May, some seasons: and by the 20th to the 24th of May in late or cold springs.

June 8, 1890.—This pencil sketch of the sweep of Garbotch I have made this afternoon with extreme care, since it shows to the best advantage, the real character of a first-class breeding ground for the uses of the fur seal.

The entire underpinning to the Reef and Garbotch is lava, basalt, in which at some points, notably on the Reef Point, much iron is embodied. This basalt is either dark purplish or reddish black, or else of light-gray tint; sometimes it is solid and compact: then again, thickly peppered with air holes and bubbles. On the point of Garbotch, in this picture, the breeding ground is a smooth slope down to the sea, from the summit, of polished breccia or soft, grayish-black and dull-red scoriæ: worn to an entirely smooth surface by the attrition of the flippers of hauling seals. But, under Old John Rock, large bowlders are heaped promiscuously from the crest of the ridge to the surf: and this rough surface continues to the limit of the rookery under my seat by the edge of these bluffs by the "Cap." When I first came down to this rookery in May (21), 1872, I had great difficulty in getting in from behind to Old John Rock. Clubs had to be used to drive the bulls away; now there is nothing in the road there, or anywhere else on the crest of the entire rookery. It does not seem to me, as I write, that there are five bulls here to-day where there were 100 eighteen years ago. Lichens and mosses now growing on rocks where restless breeders annually polished them brightly then.

June 11, 1890.—Natives made their first drive of the year for the company this morning early, from the "Crest," of about 1,000 holluschickie. (See Note Book II, hauling grounds.) That picture opposite shows the

ground as it is really occupied by the bulls to-day. It is a fair sample of the occupation of every other one of the great breeding grounds of St. Paul. In 1872 there were right on the field of this drawing just as many bulls to be seen as there were rocks uncovered. Look at the scene now! This is a pre-Raphaelitic sketch. Visited Reef and Garbotch this morning; no change in bulls substantially from what is above noted; 2 cows on Garbotch, and Antone reports a pup on the Reef.

June 17, 1890.—The cows are hauling in small squads. This is about as in 1872; but not a single "polseecatch" along the water margin of this rookery to-day; not a single one, and none upon the ground with the old males, where there is plenty of vacant space and nothing to oppose them. "Where are these half bulls which played so prominent a part in the settlement of the rookeries in 1872–1874?" I asked T. this evening and his assistant, Mr. R. They replied that they observed that this class of seals was not on the rookeries to-day. Mr. T. said that five years ago he saw the last of them, in so far as his observation went, at Tolstoi. On calling Mr. Goff's attention to it, he declared that he never observed a young bull attempting to land on the rookeries last year: and that he believed that the natives told the truth when they said to me in his presence at Northeast Point, that these animals were "quite all killed."

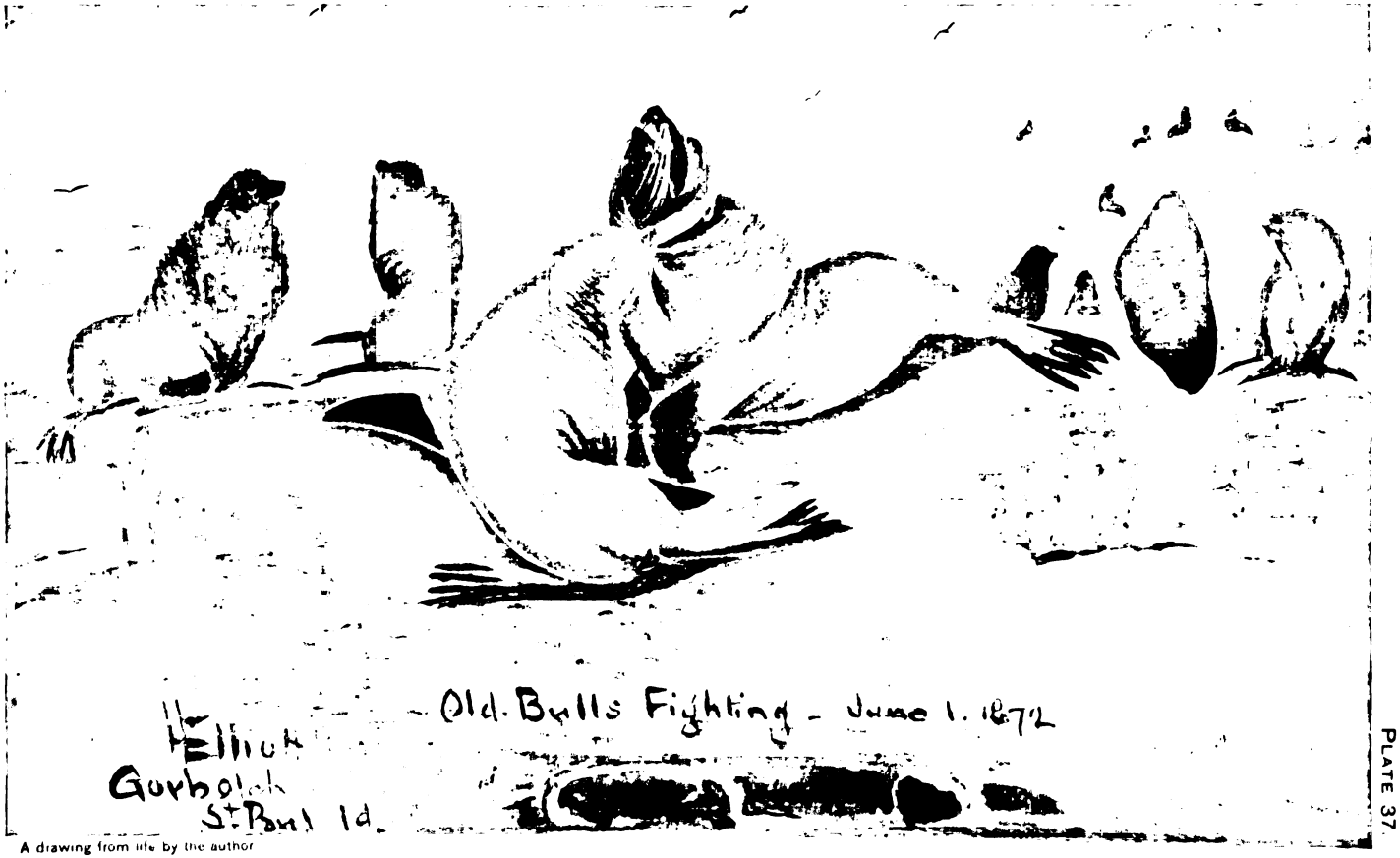
June 18, 1890.—How singularly regular the fog and drizzle is around and on these islands. Here, during the last two weeks, with only one or two brief intervals, the wind has blown from every point of the compass from a stiff breeze to a gentle air, yet the fog and the drizzle have been and are constant; just as it was in 1872. Not so much rain, but a steady drizzle daily beaten into your eyes and clothes by fresh to violent winds. A thick fog and "booze" or drizzle does not prevent seals from landing; indeed, it seems to encourage them; but a heavy rain with hail or sleet will drive them into the water from the hauling grounds. They will, however, soon reappear after the cessation of this particular kind of meteorological disturbance.

June 19, 1890.—I myself have not seen a "killer" (*Orca*) yet thus far, but I am credibly informed that these enemies do appear here every summer later on and in the fall (when the pups are just beginning to go to sea) in greater and greater numbers every year. Also that within the last three years, two exceedingly severe October gales have prevailed, causing those deadly "surf nips" by which an immense number of pups were destroyed.

If it be true what I hear now, then between the "killer whales," the "surf nips," the killing of the half bulls, the killing of yearlings, driving from rookery margins, and pelagic hunting, the seals of these islands have little chance short of extermination, unless the remedy is applied at once.

June 21, 1890.—Again I look over the sea margin and not a single "polseecatch" at the water's edge. In this connection, arises the strong assurance which the natives here gave Bishop Veniaminov in 1832, that these young half bulls which are driven up in the daily drives become thereby, utterly useless as breeders thereafter; that they are demoralized and broken up physically so that they lay around simply as outcasts or vagrants.

I took notice in 1872 of the fact that there was a large number of these apparently big, able-bodied bulls always hauled out and hauling with the holluschickie, and lying in squads along on the sand beaches whenever and wherever I went out in June and July during the inception and height of the breeding season. I then gave them only a



A drawing from life by the author

ADULT MALE FUR SEALS FIGHTING—"THE SURVIVAL OF THE FITTEST" SIRES: GARBOTCH, SAINT PAUL ISLAND.

This struggle between the breeding bulls was of incessant occurrence during the breeding seasons of 1872-1874; it never took place under the author's eyes on these rookeries during the breeding season of 1890; too few bulls, and they, in turn, with more cows than they desired to serve.

PLATE 37

thought of their being "soured" and beaten bulls, since the rookeries were simply ringing with the noise of fighting "seecatchie;" and there were then so many bulls on those grounds, that the absence of these was not of the least account. But now, this feature comes up again to me; and, is not this plaint of the natives to Veniaminov in 1832, wholly correct? and does this not account in a very large measure for the vacancies on, and the astonishing somnolence of the scattered old bulls which I see to-day on the breeding grounds?

June 22, 1890.—The cows are just faintly showing themselves on this Garbotch side: and a little better, but not much, on the Reef line. They are falling far behind the record of 1872 at this hour.

June 27, 1890.—As the Garbotch side of this rookery is in full view from the village hill, I have come down here, since the above note. I can see the sweep of Garbotch, and that tells the story just as I have recorded it under Tolstoi and Lukannon. As this, however, was the first rookery I took the land angles of, so it will be the first one to be mapped with the cows on the 10th proximo.

June 28, 1890.—Made a tour of Garbotch and the reef this morning and find a feeble suggestion of the hauling of the cows in 1872–1874. Although there yet remain ten days ere the full limit to the coming of the females is reached, yet enough is suggested by the exhibition of the hour to make one very thoughtful—as much, nearly, as the extraordinary scant hauling of the bulls did early in the month. The wide empty areas between the podding females, in which nothing now is seen and upon which bulls were thickly clustered in 1872, all roaring and fighting incessantly, strike me most unpleasantly and foretells what the result of my survey must be in a measure.

The females are hauling very slowly, and that point below the "Crest" where the holluschickie were driven from this morning is swept bare—not a bull on it—showing that the result of the present method of driving from the outskirts or immediate line of the breeding seals, is to break up and dissolve that organization at that place.

The reef rocks which lay awash south-southwest from the Reef Point, seem to have a bond of submerged union with the south end of Seevitchie Kammen, for the sea breaks in a continuous roll across; and again from its north end to the coast of the Reef rookery, south-southeast from Reef Pinnacle, this reef continues. The water is bold enough all around outside of this.

July 1, 1890.—A circuit of the Reef and Garbotch this morning shows that the bulls are certainly inadequate for the service which their scant number and wild hauling entails upon them. Scattered harems of 65 and 70 cows are stretched along Garbotch, with but a single bull to each: while at the same moment there are vacant intervals of a hundred and hundreds of feet between them in which old bulls, all without cows, are placidly sleeping. *No fighting; no young bulls landing*, and the ragged rookery belt does not mend. The cows are slowly arriving, and will, until the 10th instant. Then I shall map them down. But as I view them to-day it is impossible to avoid the plain evidence of imperfect, dilatory, and feeble service, as contrasted with the vim and vigor here of 1872. Here the grass is rapidly covering the grand Reef parade of 1872–1874, and that confervoid growth which always appears immediately the next season after the one the seals cease to haul on an old hauling ground: I can not walk over this place without positive feelings of regret and astonishment. The alteration is simply immense, and all for the worse.

July 10, 1890.—In company with Mr. Goff and Dr. Lutz I made my

plotting of the breeding seals as they lay on the Reef and Garbotch to-day.

Here, at the very height of the breeding season, when the masses were most compact and uniform in their distribution in 1872–1874, I find the animals as they lay to-day, scattered over twice and thrice as much ground, as a rule, as the same number would occupy in 1872—scattered because the virile bulls are so few in number and the service which they render, so delayed or impotent. In other words, the cows are restless. Not being served when in heat, they seek other bulls by hauling out in great jagged points of massing (as is shown by the chart) up from their landing belts.

This unnatural action of the cows, or, rather, unwonted movement, has caused the pups already to form small pods everywhere, even where the cows are most abundant: which shadows to me the truth of the fact that in five days or a week from date, the complete scattering of the rookery organization will be thoroughly done. It did not take place in 1872, until the 20th to the 25th of July.

In 1872, these cows were promptly met with that service which they craved, and never hauled outside of their solid uniform, massing as they covered the rookery ground. The scattering of these old bulls to-day over so large an area is due to extreme feebleness, and combined in many cases with a recollection of no distant day when they had previously hauled thus far out on this very ground, surrounded by harems, though all is vacant and semigrass-grown under and around them now.

It is impossible not to consider the question which this scene every moment prompts, What proportion of these old males which we see here now, overdone and scant in number—what ratio of their number will live to return next year? And if they do all live to return, what manner of good will they be? In many cases will they be potent at all? And again, not a single young bull to be seen on the breeding grounds or at the breeding margins. Where are they coming from? They, so conspicuous by their numbers and aggressiveness in 1872–1874. Where is the new blood which must take the place of the old and enfeebled sires before us, already failing to meet the demands of the hour on every side and ahead of us? Where is it?

The only answer which my study of this season gives me, is that there is no new blood mature enough left. The club and effects of driving have destroyed it; slowly at first, but surely throughout the last eight years, and rapidly during the last three of this period—especially rapid last year and at the present hour.

The pelagic hunter has lent his aid since 1885, to this destruction. He has destroyed the cows especially; but, the half bulls have been chiefly eliminated by driving, and the club, which has smitten nearly every one of them as "smooth" 4-year-olds whenever they appeared in the drives during the last ten years throughout the killing season.

In 1872–1874, when no driving was made from Southwest Point, from the Zapadnies, and all English Bay to the westward of Neahrpahskie Kammen, from Polavina, or anywhere between it and the hauling grounds of Lukannon, then there were reservoirs of young male life that were not drawn upon or disturbed from which a steady stream of new male blood for the breeding grounds could and did flow. That year here, when they first began to systematically drive from these places, marks the beginning of the decay and present deplorable condition of these rookeries of the Pribilov Islands. This extended driving began in 1882, and was firmly established in 1884. The pelagic killing began in 1886, and from that year these two agencies have gone forward hand in hand with this work of ruin and depletion.

PLATE 38.

A drawing from nature by the author.

AN OLD BULL CRIPPLED IN COMBAT, JULY 2, 1872.

A common sight in 1872–1874; nothing of the kind took place in 1830—not even a suggestion of it.

THE LAGOON.

June 13, 1890.—I think that there has been little or no change in the topographical character of this lagoon sea wall since my surveys of 1872–1874, except that in its height I think the bowlders are shoved up higher by ice floes, some 6 or 10 feet, perhaps. The lower segments of the rookery wall are unchanged, being just above surf wash at high water, and the comical choochkies are breeding in the chinks, just as usual.

The shoving up of these bowlders, which compose the lagoon sea wall on which this rookery is established, has also resulted in perceptibly shoaling the cove. Although the sand therein has shifted some, yet it all appears very natural to me.

The rookery itself does not show up any better than a ragged remnant of what it was in 1872.

My sketch shows the Lagoon rookery, the slough, the killing gang at work on the village killing grounds, and the Lagoon salt house, all as they appeared this afternoon at 4 p. m.

LUKANNON.

June 2, 1890.—A strong west-northwest wind blew all day yesterday, with snow, which covered everything white and wet last night. The wind still blew this morning: but the sky cleared at noon and the snow quit.[1] I made a visit to Ketavie, taking angles from the base of Black Bluff up to Lukannon Hill. I do not observe any great increase of bulls to-day; a few more: still, large areas are unoccupied by these animals right down to the water line. They have hauled at odd intervals as far back as they did in 1872, but no crowding into the same area at all.

Some bulls have ascended high up on the flanks of Lukannon Hill: but large intervals of from 50 to 100 feet of vacant ground lie between them, and this day is not more than two or three days in advance of the first arrival of the females. I can not avoid taking significant note of this point. These old bulls that now appear, are all in good physical trim outwardly; they look well.

The snow seems to surprise some of those bulls; they smell and smell at it, then roar angrily. A squad of small holluschickie were in the center of the rookery area on Ketavie, this morning.

June 12, 1890.—Very slight change in bulls during the last ten days. They have hauled here very wildly far back from the water, with large areas of 30 and 40 feet between them. Two cows in sight here; one "rusty," so must have been hauled out several days. She has a pup. Mr. Goff reported the arrival of a cow here, two days ago. Perhaps this is the one, so that this pup has not been born long; a few hours or a day at the most.

June 22, 1890.—A survey of Lukannon rookery this afternoon shows an astonishing apathy among the bulls, *and not a single half bull on the shore or in the water.* A few clusters of cows just along the water margin are all I see. They have been out at least four or five days, because they all look rusty. The newly-arrived cows are very conspicuous for a day or two after arrival by reason of their shining white abdomens and silvery-gray backs and necks. There is not a bright cluster of cows anywhere in sight to-day on Ketavie, Tolstoi, Lagoon Reef, or Garbotch. This shows how gradually and slowly these small clusters have grown in size since the first arrivals on the 4th and 5th instants.

[1] A fall of less than 3 inches; remained two or three days.

June 24, 1890.—Scarcely any change for the cows to-day. Those holluschickie on the sand have hauled up on the hill, about 100 feet, and are now sleeping in among the breeding bulls.

June 27, 1890.—Scarcely any change.

July 1, 1890.—I have passed three hours this afternoon marking and watching the service of the bulls in their harems. It is simply lifeless, languid, and fairly impotent; wholly so in many cases at this early date. What will it be ten days later, if it is so feeble now at the outset? Saw two "polseecatchie" at the water's edge and one at the rear. Where, indeed, are these animals? What, indeed, is on hand, or will be for the next six years to come, to supply the places of these scattered and already enfeebled sires of the rookery?

July 10, 1890.—I made a careful survey of the area and position of the breeding seals on Lukannon and Ketavie this afternoon in company with and aided by Mr. Charles J. Goff. On Lukannon, while there appears to be two-fifths as many cows as in 1872, yet the bulls do not average more than one-fifteenth of the number they showed at that time. No better on Ketavie; if anything, a shade or two worse. *No young bulls anywhere offering service or attempting to land on the rookery.*

KETAVIE.

June 13, 1890.—A comical picture was made to-day when, in the afternoon, the entire herd of mules, 10 in number, filed over from the village and pastured on the seal grass that grows on the deserted outskirts of the rookery at Ketavie. The old bulls in waiting paid not the least attention to them that I could see, while the mules were equally indifferent. I presume that such a pastoral scene as this has never been witnessed outside of these islands.

June 22, 1890.—As this is the time the cows begin to haul in appreciable numbers, I took a careful view at this (Ketavie) rookery to day from that point of sight in the sketch opposite. I saw but three clusters of cows in all the sweep of this picture, and they in the foreground right between the first and second rollers as they came in. These pods were bevies of from 30 to 50 cows each, all thickly clustered around a single bull with all the other bulls stretched in somnolence around them: just as I recorded the state of affairs on Tolstoi yesterday; and, as I go over the field on Lukannon right after this, I find it precisely that way there. This apathy of the bulls, coupled with the total absence of the "polseecatchie" (or half bulls) on these breeding grounds at this hour is a striking contrast with that vim and fury that was so marked among the swarming bulls of 1872 on this and every other one of the breeding grounds of the Pribilov Islands. It is in order to record the fact that the cows are not hauling in anything like the numbers of 1872–1874. On Lukannon and the Lagoon the dearth of cows to-day is noteworthy: while, at Tolstoi, nearly every cow there this afternoon is as I described it yesterday; three small pods right down at the junction of rocks and sand under the cliffs: 250 cows perhaps on that whole ground this afternoon.

TOLSTOI.

June 12, 1890.—A tour to-day on Tolstoi shows little or no change in "seecatchie" from last date. I saw no cows. Quite a troop of holluschickie on the sand, just above surf wash, and beyond the drop of the rookery to the sand beach.

The old bulls are hauling here very wildly—way back 500 feet with 50 to 100 feet between them in many instances. *No fighting anywhere, and no young bulls at the water's edge.* The polseecatchie—perhaps I

PLATE 39.

A drawing from nature by the author.

KETAVIE ROOKERY FROM THE BLACK BLUFFS, SAINT PAUL ISLAND, JULY 7, 1890.

View looking NNE., over the abandoned hauling grounds and decimated breeding grounds, to Ketavie Rock and Point in the middle distance; Polavina and Stony Point heads in the distance on the horizon.

shall see some of them when the cows begin to haul next week, but they were in swarms by this time during 1872–1874.

June 21, 1890.—An inspection to-day shows the odd scattering of cows as they haul, and which Mr. Goff early called my attention to as a great deviation from the habit which they exhibited in my work of 1872. As this is the date in which this class begins to haul in appreciable numbers, I now begin my daily examination of the manner and number in which the cows arrive.

They commenced just as they did in 1872—a few cows here and there by the 4th to the 6th of June; then by the 15th little clusters appeared of 10 to 50 along the water's edge: to-day, instead of that exhibition of solid "wave-like," "streak-like" spread up from the water's margin to the rear limits of the breeding grounds which they gave me in 1872, *I can see nothing of the kind; not even an approximation of that stage.* Still these animals have yet twenty days in which to fill up the rookeries as they did in 1872, and it is not the time to finally speculate on their coming or number—merely idle now to do so.

But, the behavior of the old bulls is extraordinary this morning at this time of the inflowing cows. They are listless; three-fourths of their scanty number stretched out sound asleep, while right alongside of these sleepers a pod of 15 or 30 cows will be closely clustered around a single alert bull, or one that at least is not inert and stupid. There are three such pods as that right under my eyes as I make this note, lying at the junction of the sand beach and rocks of Tolstoi rookery. *No such scattering of bulls and indifference was ever witnessed on any of these breeding grounds in 1872–1874. Then every bull was alert and furious in his struggles to get possession of at least one, if not all the females within reach.* Now look at them! Why, it seems to me that these bulls are enfeebled and sick. At least it is a most remarkable deviation from the method and order of first arrival of the females in 1872. Such a picture of perfect listlessness and indifference as this, from the beginning to the end of the season, never met anybody's eye on these breeding grounds then.

No young bulls anywhere along the water's edge, or back among the old bulls, widely scattered as they are, way upon the hill slopes of Tolstoi this morning, at least 550 to 600 feet away from these first cows—widely and thinly scattered old bulls: all of them now stretched out in sound sleep.

June 23, 1890.—This is the day in 1872 when the cows had hauled in sufficient numbers to impress me deeply for the first time as the season then advanced. At this time in 1872 the most casual observer would note the arrival of the cows as "coming up in families or streaks, as it were, from the water's line upon the ridge" (as per MS. note of June 23, 1872, made as I looked then at Garbotch slope). The peculiar "fanning" of the cows then, as they used their hind flippers made their resting places conspicuous at any moment to the eye as it glanced over the rookeries.

To-day, it takes a sharp, trained eye to find the scant scattered pods of cows as they rest just above the surf margin: and, as for "hauling back" up on the ridge, not the first symptom of such a movement is in progress.

As you stand and look across the cove at the Lagoon rookery, not over 900 feet away, you can not see the least visible evidence of the landing of females this morning. I can make out a few scattered heads, but no concerted arrival of these animals: it was very obvious in 1872–1874 at this time of the season.

June 24, 1890.—That peculiar podding of the cows, which I noted on the 22d, still continues. The cows still cluster in groups at the water's edge, with no attempt yet made to haul up in long "wave-like streaks" to the high ground in the rear.

Strange, in this connection, is the hauling of these somnolent scant bulls. Why, several of them—yes, a dozen—are now up 600 feet back from these cows at the surf margin on the sand, and vacancies of hundreds of feet between them. *Not a fight in progress, and not a single young bull in sight at the landing of the cows.*

June 27, 1890.—I observed on Tolstoi the arrival of a few more cows, the first I have yet seen that wore the fresh attractive toilet of these creatures. They are still crowding in on the sand in that strange manner above alluded to, and still but a very faint advance made in any single spot toward filling up the ground, back from the surf margin. The bulls are still hauled in that wild manner which I have so frequently noted, and are sleeping stupidly everywhere, with the cows landing just around and below them.

June 30, 1890.—A survey of Tolstoi this morning shows the most striking want of alert bulls; that there are pods or harems of 60 females with only one bull; that the sand beach end is the chosen resort of the solid hauling of cows, while the rocks up in their rear are positively deserted. I do not see that the cows are arriving so as to make any considerable number of them show white and silvery. But the few that are here, are under full swing. The strange, wild hauling of old bulls, and the remarkable absence of the "polseecatchie" is still prominent. I see two half bulls at the lower end of the rookery ground, right under Fox Castle. These are the only examples of their kind on the field. I have been constantly saying to myself, "Now I can easily count every bull on this rookery that is here to-day." They certainly do look lost among the rocks in the rear and in the large pods of cows at the water's edge.

The cows are pupping; are caring for themselves precisely as I have hitherto recorded the act, in 1872, at this time.

July 1, 1890.—A survey of Tolstoi this afternoon shows little change during the last three days; if any, it has been an increased solidity to the belt of the females on the sand. I think their hauling here as they do, one of the anomalies of this all around extraordinary state of affairs.

As I again look at these old bulls hauled out here above those cows, 500 and 600 feet away from them, and not a half dozen bulls between them, I begin to think that perhaps they do so because a few years ago when they were here, cows then hauled out to them in solid masses from the water. They did so in 1872, I find by my maps. And so, perhaps, that is the season why they, the bulls, are out here again without any visible reason for their so being. It is the same way on the Reef and Garbotch, at Lukannon, and especially so at Zapadnie.

I took notice of a large proportion of small or 2-year-old females, and the usual slowness of hauling, compared with 1872, which was not at its greatest activity up to July 7.

The usual parade of foxes in and out among the breeding seals now presents itself. I saw one to-day running off with a fresh placenta, or "afterbirth," in its mouth. There is a marked diminution of the number of foxes, as contrasted with my notes of 1872. They have been mercilessly hunted during the last ten years: last winter Mr. Goff ordered a "zapooska" for their benefit and preservation. This season is one of unalloyed physical and mental comfort for Reynard. He has all the fresh meat, waterfowl, eggs, and beetles that he can eat, and the

delightful assurance that he is never shot at or trapped at this time of the year. At the present hour they are shedding, and they look scrubby enough. Generally, the old hair on the tail hangs the longest, even after all is renewed everywhere else on their bodies. Thus you constantly see around you now, a bluish-gray fox running off with a fluffy, dried-grass colored tail—a very odd-looking contrast.

July 7, 1890.—From a station on the bluffs overlooking the entire stretch of the cliff belt of the breeding seals at Tolstoi, I passed two hours this afternoon, intently observing the service which the bulls below were rendering. There were 67 bulls directly within distinct sweep of my vision: distinctly and widely separated; and these bulls had some 2,000 to 2,500 cows. It is fairly idle to attempt to express the perfect impotency of these overdone and feeble old males; sleeping or dozing nearly all of the time: and, on waking, teased by the females without arousing them in the least. I saw in these two full hours of attentive watching only three attempts to serve the cows by these 67 bulls, and each attempt was a languid failure. *Not a single half bull or polseecatch attempting to land here or anywhere else for that matter on the rookeries to-day.* How many of these cows are going off without impregnation if not served when in heat? Do they ever return for it? And if they do, where is that service to come from? Certainly not from those already useless bulls which are hourly growing weaker as the season culminates. I saw to-day a nubile female and an older one engaged at the same moment in teasing a languid old bull, which made an ineffectual attempt to satisfy one of them, and failed. I never witnessed such a scene in all of my observations of 1872–1874. Then there were twenty bulls where there is one now, and three times or four times as many cows. Late in the rutting season, about the 20th to the 24th of July, an occasional exhibition of languid impotence was seen: but, it made no impression on my mind other than to note the fact that here and there was a bull which was physically exhausted, chiefly from the effects of fighting. Still there were then so many virile bulls right around it, ready and eager, that it did not signify.

One of the odd orders at Tolstoi is the fact that the best massing of the cows now is seen down on the sand at the extreme extension of the rookery out toward Middle Hill. It gives one the only suggestion of what the compact solid massing of the rookery was in 1872, and which massing is now utterly lacking on these breeding grounds of St. Paul and St. George.

There are few cows, pups, and bulls to-day on that cliff belt of Tolstoi. Instead of an area of 36 feet in width, densely covered, as in 1872, to-day there is an area of only 1,750 by 10 feet covered, equal to 17,500 feet, or ground for 8,750 seals—bulls, cows, and pups—instead 36,750, as in 1872.

That parade ground up and over this breeding belt under the cliffs at Tolstoi *is wholly deserted by the holluschickie. Not a single animal has hauled out there upon its grassy patched surface thus far, this season.* Out near the point, is that queer climbing path up the cliffs from the sea to this ground. Here in 1872 I have sat for hours at a time watching the seals come up and go down in ceaseless files of hundreds and thousands, actually climbing up places so steep that it was all an agile man could do to follow them safely.

I saw about 50 or 60 holluschickie on the cliff steps to this path to-day: but, none of them seem inclined to go up on to the old parade ground above. The natives call this particular locality "Bobrovia yama," or the "sea otter cave."

July 10, 1890.—Made a careful survey of the area and position of the breeding seals on Tolstoi this day in company with Mr. Charles J. Goff. * * * In July (14), 1872, this Tolstoi rookery held 225,000 bulls, cows, and pups. A startling decrease of nearly three-fourths or 72 per cent loss here since 1872, or of 162,600 seals!

ZAPADNIE.

June 13, 1890.—I think the bulls on Lower Zapadnie show the thinnest in distribution. Certainly this great rookery, which swarmed with rousing, fighting bulls, closely massed over all the breeding space mapped out on this ground at this time in 1872, is in a great decline. The few bulls that are here, are hauled out so widely and so far from the water—in places they are 1,000 feet. I think they act as though they were anticipating nothing. A few cows, perhaps four or five, are all that I saw this day here, and three on Upper Zapadnie.

I have fairly got this rough-surfaced rookery chartered to-day. It is a queer place to view the seals. They lay in curious little valleys and canyons which have been created by hot lava bubbles in prebiological days. But that scant distribution of the bulls in these places to-day, puts me continually in mind of

"Some banquet hall deserted,
Whose garlands dead,
And guests have fled, etc."

Upper Zapadnie is equally thin on its hill slopes, and what is more, the water's edge line is vacant at frequent intervals. There is an occasional roar and some characteristic "spitting," *but none of that desperate, incessant fighting that prevailed among the closely thronged bulls on all these places in 1872.* The rookeries to-day, on this occasion of the first arrival of the females, are positively quiet. The unbroken uproar that boomed night and day from them then in 1872, is not more than faintly suggested by what I hear now.

June 26, 1890.—I have not seen much of Lower Zapadnie to-day—only a running survey from the sand beach—while I had a fine view of Upper Zapadnie and its beach extension. Upper Zapadnie shows the same decadence, but not so painfully marked, as Lower Zapadnie. The beach extension, however, is remarkably vacant, in so far as cows are concerned.

July 3, 1890.—The hauling of the cows on Zapadnie to-day is extraordinary in contrast with its appearance here in 1872 at this time, and only a week from the hour of its utmost limit of expansion. Really I can not see much increase since my notes last week. But, such rusty cows, such somnolent stupid bulls; such an abnormal average as 60 to 75 cows in the harems: while lots of sleeping bulls are all around, though only some 40 to 50 feet away from these harems, where the bulls in charge, are so feeble that they refused the advances of eager cows repeatedly under my eyes within less than twenty minutes after I had set a fixed watch on half a dozen right within my view and near by.

Driving as it has been done has the deplorable effect of widening and scattering the already too wide and scattered distribution of these breeding animals. I saw this result on the reef after it had been swept on the 1st instant. The same extending vacancies on the water line of this once great compact breeding ground is plainly visible to-day. Every little pod of holluschickie that creeps in now behind a harem, laying close up to it instinctively for shelter, is at once marked and swept out, up and into the drives. This huddles the cows into larger and larger masses, sweeps off and away the few surplus old males, and leaves the

A drawing from nature by the author.

MIDDLE HILL. TOLSTOI HEAD. REEF POINT.

THE DESOLATION ON THE HAULING GROUNDS OF ENGLISH BAY, SAINT PAUL ISLAND, JULY 11, 1890.

View looking east from upper Zapadnie beach extension, opposite Hair Seal Rocks, over to Tolstoi. Upon these abandoned sands the holluschickie fairly swarmed during the seasons of 1872-1874.

PLATE 40.

ground in worse and worse shape for a bad season at the least. This driving from the immediate vicinity of a breeding ground was never done after June 5, in my time. Then rarely, and only to get a few hundred seals early, as they first arrived for the natives' food. This always took place before any noteworthy arrival of the cows.

July 9, 1890.—I made a close reconnoissance of the breeding seals as they lay upon the ground at Zapadnie, both upper and lower wings, this morning immediately after the natives had driven the small squads of holluschickie which they alone find here now, and only in spots, laying up in close proximity to the cows. I went over at 4 a. m. purposely to see the *modus operandi* of the driving, and then to get a fair idea of the full expansion of Zapadnie as it stands to-day.

July 11, 1890.—In company with Mr. Charles J. Goff I visited and surveyed the entire sweep of Upper and Lower Zapadnie rookery to-day. * * *

It is impossible to convey the queer sense of utter desolation which the vacant seal area of 1872 on this fine rookery carries to my mind this morning. Grass and flowers are springing up over those broad areas back of the breeding grounds, where in 1872, thousands upon thousands of young male seals hauled out and over, during the entire season, without being visited by any man then, except myself. Nobody at that time ever thought of such a thing as coming over from the village to make a killing at Zapadnie. And then, too, those splendid areas of hauling ground in English Bay, are all grass-grown, mosses, lichens, and flowers, which in 1872–1874 so astonished Maynard and myself by their teeming squadrons of young male seals.

Judging from the appearance of the grass, I should say that the seals must have ceased to haul here to any great extent as late as 1883: and, by 1884–85, to have suddenly dropped out of the field in large numbers. That no seals have hauled in the rear of these breeding lines of 1872–1874 since 1878–79, is certain: because this area in now well sodded and sprinkled with a full crop of *Archangelica*, which never comes in sooner than eight or ten years after the seals have once destroyed it. This time of the regrowth of "pochkie" was well demonstrated to me at Zapadnie in 1876. There, in 1868, Morgan's sealing party built a salt house right in the center of a well-polished hauling ground of holluschickie. The seals at once, of course, abandoned a large space directly and indirectly dominated by this salt house, and the killing gangs. The grass upon this abandoned hauling ground of 1868, was pretty well tufted and established when I first saw it in 1872, and in 1876 small heads of the *Archangelica* began to sprout everywhere anew over it. This shows that eight years after the seals ceased to haul upon a hitherto well-polished area by them, plenty of rank grass was growing upon it with many flowering plants, and a beginning of a new garden of that rank, umbelliferous *Archangelica*, above specified.

POLAVINA.

June 3, 1890.—As there is not the slightest appearance of change to the sea margin of this bluff-banded rookery during the last sixteen years, nor is there ever likely to be, I simply redraw my original land angles of 1872–1874, establishing, however, two additional stations—one on the point at the grotto, B, and the other on the beach below at C. This will cover the showing of any change that the breeding seals may present on that portion of the rookery ground which can be altered by surf and ice-floe pressure during storms in the fall and the winter and early spring. The land angles of Little Polavina are precisely as they were in 1872.

June 4, 1890.—An odd seal bridge and grotto is on the extreme point of Polavina, and makes one of the queerest sort of subjects for the pencil. When I visit it in July I presume I shall find it tenanted with a harem, although it may be a thoroughfare, since the seals can haul up through it.

I take this sketch of Polavina Point from my station, C, just 300 feet below those bulls in the foreground, and which maps out, as they lay to-day, the southern limit of the present extent of these breeding grounds. On this flat of sand, just above surf wash, basaltic bowlders, mostly small ones, are thickly strewn, with many pieces of driftwood. That remarkable reef table which projects out under Polavina Point, is well bared to-day, by the low tide and gives me a full view. It is a solid, flat table of purplish basalt, covered with innumerable pools of water and forests of sea weed, which fairly glisten as they are now bared, damp and dripping.

June 25, 1890.—I revisited this morning, that spot from which this sketch is taken. A few small clusters of females have arrived, as shown in the sketch on the other side of this page. The number of vagrant bulls dozing on this sand beach in the foreground has increased vastly, but the cows are very scant in number for the day. They are feebly suggestive of that wonderful massing which they were making on this ground in 1872 at this time.

I thought at the time when I established this station, C (on the 4th instant), that it was way below where the rookery would go this year, judging from the lay of the bulls then. I now see it plainly.

July 13, 1890.—Visited this rookery ground and surveyed the area and position of the breeding animals in company with Mr. Goff. * * *

My final survey of this rookery shows it to be one of the two rookeries which seem to have suffered only half in loss of form and numbers. I can not avoid the conclusion, however, that this rookery, like Zapadnie, has been cruelly driven during the last four or five seasons: perhaps the last eight years, since the chief hauling grounds always laid up behind the breeding lines of Polavina. Therefore, when shrinking of holluschickie began, the scraping of the large semicircular edge of Polavina rookery commenced in earnest, since the young males naturally do here as they do everywhere else on this island to-day, lay up closer and closer to the lines of the breeding seals.

NOVASTOSHNAH.

June 2, 1890.—Came onto the great rookery ground this morning from the Arago. Made my headquarters in Webster's new house, and prepared for the day's work. A clear day with light north wind. I find the bulls here in as good or better number than on any other rookery of this island. Still there are large vacancies and several wholly deserted sections.

A greater number of sea lions than I expected to see—several thousands of them clustered principally on Sea Lion Neck and Northeast Point, although they haul all along the east, north, and west shores of this point. The bulls were in full rutting ardor. There were several cubs or pups newly born. Their stifled wheezing, roaring, deep gutterals and grunting groans come out into sharp contrast with the clear-cut voices of the fur-seal bulls, which haul out here side by side with their huge cousins.

I saw very few holluschickie to-day, although I inspected every foot of the great rookery.

That slope of Hutchinson Hill which drops to the westward, is cer-

tainly the most imposing single sweep of seal ground on the islands. It is impressive and extensive. The seecatchie here to-day appear in as good numbers as anywhere else on St. Paul Island. Still I must truthfully add that they are in woeful contrast with what I have recorded here in 1874.

June 4, 1890.—These sand dune tracts at and around the neck of Northeast Point have changed character somewhat since 1872. Then everything on this high, bare sand knoll of to-day, which rises from the Big Lake and separates it from the surf-sand flat level of the neck, was grassed firmly over; but now, from some cause or other, sand has been blown up and over, completely covering the lower grassy hummocks or knolls. It leaves now, a desolate, deep sand ridge to cross and recross as you go to and from the point, and the surf also beats upon a wider spread of sand on both sides of the neck, washing completely across in storms with much driftwood and many small basaltic "donicks" or bowlders interspersed in lines with the wash of the surf.

This sand is simply powdered volcanic rock, with a liberal admixture of comminuted sea shells and other minute marine conchological forms.

The Big Lake seems wholly as it was: so does the trail down among the sand dunes on its eastern shore. The genesis of a finely fixed sand dune here is as follows: First a heap of wind-rifted sand from its drying out above surf wash. Into this the seeds of the *Elymus arenaria* are carried: and, sprouting, throw the strong, deep roots of that coarse grass down deep, binding the heap as it were. This grass alone seems to possess the power of taking hold at first and successfully growing. The other plants and grasses can and do germinate, but the first strong wind thereafter raises the sand about or from under them so as to either smother them or destroy their roots; but this "wild wheat," the *Elymus*, has such deep-reaching roots, as pronounced in this respect as those of the alfalfa, that it can not be blown out, or blown under, very often.

But, when the *Elymus* has firmly anchored a sand flat, then a grass closely resembling our timothy or orchard grass takes hold in its company, and with several species of mosses and the creeping willows (*salix*) and wild pea vines, finally crowds the hardy *Elymus* fairly out within a few years, or at least leaves but a scanty remnant of its former exclusive holding. However, there are extensive tracts on St. Paul where the sand is unusually light, deep, and restless. Upon these areas, and on the killing grounds where the bodies of millions of seals have decayed, making a rich, hot compost out of the dry, sterile sand, there the *Elymus* grows strong and luxuriant, without a rival—nothing else can get in.

July 13, 1890.—I made my land survey of this point on the 2d and 4th of June: and from that time until this day, I have not been on the breeding ground. But now the hour having arrived in which to see the breeders at their finest limit of expansion on the ground occupied by them, I made this morning, in company with Mr. Goff, a careful, rod by rod inspection and survey of the field. Every section from point to point as we advanced, from station to station, was carefully platted on the chart, with a distinct memorandum of its massed depth: the land angles giving the exact number of feet of sea margin which each section possessed. In this way, foot by foot, we progressed around the entire circuit, jotting down every expansion and contraction of the breeding lines, and every vacancy. This is the only method by which a uniform, fair statement of fact, and estimate of the numbers, area, and position of these rookeries can be made. To attempt to carry in your mind an estimate over this irregular ground, and distribution of life upon its surface, is simply a physical impossibility; and an attempt

to measure this area with the life as massed upon it, with a tapeline, is equally abortive and ludicrous.

But, my angles, taken with a fine prismatic compass from my several stations established with initial base lines, locate these herds just as they rest upon the ground to-day. By having the topography all finished June 2 and 4, I now rapidly and accurately plat upon it. as I traverse the field, these herds, just as they lay under my eyes.

Thus, all guesswork is wholly eliminated, as it should be, from the exact location of the position and area of these rookeries. Then, upon this known ground of occupation, a sensible rule for estimation can be based.

July 26, 1890.—Daniel Webster is the veteran white sealer on these islands. He came to St. Paul in 1868, and, save the season of 1876 (then on a trip to the Russian seal islands), he has been sealing here ever since, being in charge of the work at Northeast Point annually until this summer of 1890, when he has conducted the killing on St. George. He spoke very freely this afternoon while calling on me, and said there is no use trying to build these rookeries up again so as to seal here, as has been done since 1868, unless these animals are protected in the North Pacific Ocean as well as in Bering Sea. On this point the old man was very emphatic.

Webster came ashore on St. Paul Island in the spring (April) of 1868, an employee of Williams & Haven, of New London, Conn. He took charge of the sealing then begun in behalf of this firm, at Novastoshnah, or Northeast Point. Hutchinson, Kohl & Co. had the only other party up there at that time. This was the first irregular sealing ever done upon this island since 1804.

Webster said that Hutchinson, Kohl & Co. and he took over 75,000 young male seals at Northeast Point alone, that summer of 1868: and only stopped work from sheer exhaustion of their men, who were not only physically "used up," but had used all of their salt, and had no suitable means left for saving any more skins.

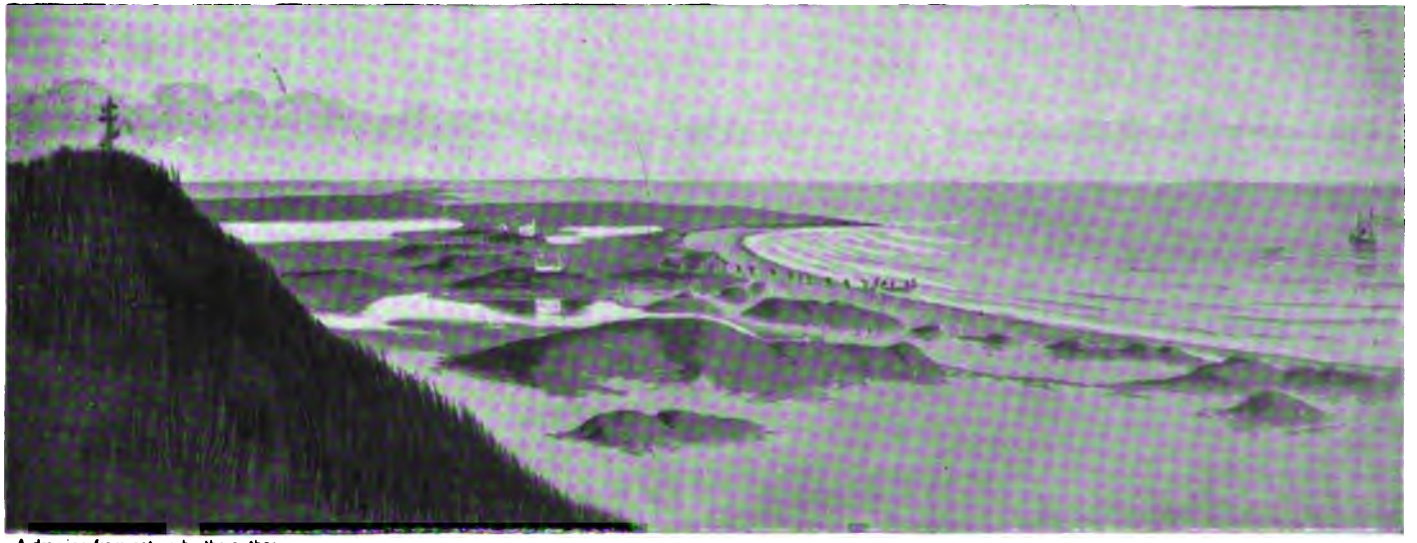
When both parties stopped work, he said, that then no apparent diminution of the number of holluschickie was evident to any of them: and that this fact created much comment. He declared that there had never been so many seals on that ground since; that "although there was a fine showing of seal, Mr. Elliott, when you were there in 1872, yet there never has been so many there as in 1868."

He said that ever since 1876–77 he had observed a steady shrinking of the hauling grounds at Northeast Point—a very rapid contraction during the last six years, especially rapid since 1887–88.

He never agreed with the statement recently made of the great increase of seals over my record of 1872–1874; but on the contrary has always held that no increase ever followed it: and that he always told both the Treasury and company agents, whenever questioned, that there was a steady diminution. He said that when down in San Francisco last (about five years ago, winter of 1885–86) he was not asked any questions by anybody as to the increase of seals: and he volunteered no information. If he had been asked he would have spoken his mind freely.

Webster said that in 1872–1874 he was able to get all the holluschickie he wanted from that sand beach on the north shore of the neck at Northeast Point. "Never went anywhere else for them, or near a rookery." He said that the holluschickie never again came down upon the southern slope of Hutchinsons Hill after the season's work of 1868 closed.

PLATE 41.



A drawing from nature by the author.

THE NORTHEAST POINT KILLING GROUNDS, SALT HOUSE, AND LANDING, SAINT PAUL ISLAND, JUNE 3, 1890.

View from Cross Hill: Webster's house, surrounded by the native house, chapel, and killing grounds in the middle distance; over them in the distance is Sea Lion Neck; the salt house and natives landing salt from the steamer *Arago*, in the middle distance to the right.

ON THE ROOKERIES—ST. GEORGE ISLAND.

NORTH.

July 19, 1890.—I came upon this breeding ground to-day after an absence of just sixteeen years. I find the topography unchanged: the hauling grounds all grass grown together with the usual flowering plants that seem to follow the abandonment of hitherto polished ground laid upon by holluschickie.

The seals upon its breeding area are in the usual form and number characteristic of this season over on St. Paul—a scanty supply of old bulls: no young bulls in the rookery or outside: large scattered harems, and every evidence of imperfect service—in all these forms precisely as they are over on St. Paul.

But this rookery, which held 76,250 bulls, cows, and pups in 1874, has suffered a loss of only one-half of its cows and pups. Of the bulls, however, a vastly greater proportion, five-sevenths of them, are missing. This rookery was the largest on St. George in 1874; it has been so ever since, and is to-day, diminished as it is. But large as it is over here, there are only two on St. Paul smaller. One is the Lagoon, and the other Ketavie, though the letter was twice as large as this breeding ground in 1874.

July 25, 1890.—Captain Lavender and Dr. Noyes made a careful survey of the holluschickie that have hauled out here, since they were driven off on the 19th instant. They agreed that if driven to-day, this rookery would not yield 300 holluschickie of over 5½ to 7 pound skins.

July 26, 1890.—No increase of holluschickie on this ground. If I may believe the apparent honest statement of Dr. Noyes and Mr. Webster (agents of the N. A. C. Co.), this rookery has shrunk one-half from its margins of three years ago: and, it is greatly worse to-day, than it was at this time last year.

This is the testimony also of Mr. Goff as to the status of the St. Paul rookeries as between this season and last. It now points with my work to the certainty of a still further marked reduction in the form and number of the breeding seals next year: while the killable seals or holluschickie will simply be minus.

July 27, 1890.—The cows and pups in full swing of "podding;" the holluschickie scant in numbers and mixing up with the scattered harems; a small pod, chiefly yearlings, hauled out on the extreme western extension, and two other small pods at the "Raichka" and "Seraidnee" on this rookery—altogether not 200 7-pound skins.

I am surprised at not seeing the due proportion of yearlings out now that a rookery of this size should claim. At least 20,000 pups left this ground last October. Half of them should be back now as yearlings, and as such show up a thousand or two every day until the end of the season. I am therefore, inclined to think that the pups are suffering a heavier ratio of loss than in 1872–1874. They are now fewer in number, and their natural enemies, such as "killer whales" here and sharks in the North Pacific, and the "killers" there too, are just as numerous and voracious as of old. The loss, therefore, inflicted from this source would be more apparent now, than when the pups were twice and thrice as numerous. In 1872–1874 I estimated that about 1,000,000 pups left the Pribilovs every October and November in fine physical trim; and of this 1,000,000 *not over half of the number came back* next June and July as yearlings. To-day, judging from the scanty returns of yearlings, I

know that the loss in pup returns is far greater. It looks as though *not more than one-quarter are returning this season of 1890 as yearlings.*

There should be at least from 3,000 to 5,000 yearlings out on the hauling grounds of this rookery daily, now, estimating that only half of them, as in 1872, are or have been destroyed at sea since they left this ground of their birth last autumn. But raking and scraping the whole extent of this rookery to-day would not produce a "drive" of 600 holluschickie of all ages, 450 of them to 500, yearlings, and the balance chiefly 2-year-olds.

I have been looking every day since the 15th instant, over the rookeries and hauling grounds for the percentage of yearling returns. By this time all those seals should show up if they are to show up at all this year. They all arrived here by the 20th of July in 1872–1874, and I presume now, this 27th day of July, that it is fair to demand a count.

July 30, 1890.—The pups nearest the water's edge on this rookery under the bluffs are all attempting to swim this afternoon. A high south-southwest wind has caused a heavy back swell, which throws water up and over into a series of odd yet perfect salt-water bath tubs, caused by the foundation of several basaltic basins in the beach margin of the rookery here. Above and below this place, those pups which are exposed to the full and direct wash of the surf, are not making any effort to play and swim in that water, but have crept higher up and are still crawling up, so as to get entirely out of the spray.

Most of the pups to-day, on this rookery, have "podded" back; some of them 150 feet from the sea margin, where, with their mothers, they are mixed up and mixing all the time with the holluschickie that are hauling.

The holluschickie are chiefly 1-year-olds; nine-tenths of the several pods hauled out here to-day are yearlings. A great many yearling females are halting down at the landings in and among the scattered harems, aimlessly paddling about. Their slight forms and bright silvery backs, white throats and abdomens, are shining out very brightly in contrast with the dark rocks, the dull brown and rusty coats of the "matkahs," and still rustier forms of the old "seecatchie." These young yearling cows finally drift up into the rear, join in the medley of sex and age there, and go and come with the rest as they go and come during the remainder of the season.

I have noticed this year, because I began at the outset to look for them, that the yearlings which come out in June were invariably males as far as I could see, whenever they were examined, as I had frequent opportunity to do, as they easily and often smother and fall in the pods into a sort of stupor which permits you to lift them by their hind flippers and drag them out of the way. But when the cows begin to arrive in full form and number, about the 1st to the 10th of July, then the female yearlings also appeared in the herds as a class for the first time.

This points to the natural fact that the young yearling males instinctively flock together and follow the older males on their return trip to the islands: while the cows attract the young females as a class—just as toddling boys will follow the older boys and men, while the little girls avoid them and flock with the young women and their elders of the same sex.

By the 20th of every July all the cows, nubile and maternal, have arrived, and that arrival brings in the last wave of yearling animals for the season. So that all of the seals that are to appear for the year are now on hand, have hauled out, and now finally haul out. It is this final and finishing arrival of the yearling cows that swells the numbers of

the yearlings as a class so markedly after the 5th to the 10th of July—sometimes as early as the 1st to the 5th of that month, if the season happens to be a very forward one. Still, I find that the records of the arrival of the females on the rookeries during the last twenty years, as they have been annually recorded on these islands, show that the cows came here every season with an amazing regularity, and precisely in this respect as I observed them in 1872–1874.

The old bulls are more irregular, varying as to the character of the seasons—favorable seasons, early in May; unfavorable seasons, only three or four days later—and all of them invariably on hand by the 1st of every June.

Since the holluschickie here, have been permitted to rest for a few days without being at once swept up, after landing, and over to the village killing grounds, they have become sensibly tamer; and like the foxes here, when trapping ceases, they seem to know that they are not going to be hustled over to the shambles again when we come in sight. To-day Captain Lavender, who is a very large man, and myself walked to within a few yards' distance from every pod of holluschickie on this rookery: and, save in case where the Captain happened to vigorously flourish his cane (in emphasis of something said) these animals gave no sign of rushing into the water or of stampeding.

This simply goes to prove that the "wildness" of these holluschickie of 1890, which some of the sealers attempted to tell me was a marked change in their natural habit of 1872–1874, is quite naturally due to the extraordinary change in the fashion of driving which the sealers themselves have instituted during the last six or eight years of increasing scarcity of killable seals. From the time, since 1881, when the first regular over driving began early in June until the catch of 100,000 was secured in July following, these animals have never been allowed to rest anywhere on the islands as they hauled out long enough to become wonted to the grounds. Naturally enough we find them "wild," especially so when there is not a tenth of the number on the ground here to-day of the holluschickie which we found here in 1872.

August 3, 1890.—The pups in that small area under the bluffs, where the surf has filled certain cavities so as to form incipient bath tubs, are now all swimming outside in the gentle swell that rolls in. They have learned to swim: but the great majority of their kind are still far back on the uplands to the rear, and, wholly unused to water yet. I notice that those pups on the sea margin which are not in the immediate vicinity of these "bath tubs," are still hanging aloof from the surf. They will, however, soon begin their water exercises, by the 13th instant at the latest, as they did so in 1872.

The number of yearling females that are loitering on the rookery ground, lolling over the rocks and nagging the pups, is larger than I have usually observed thus far, since the season for their arrival opened on the 15th of July last.

But the mixture to-day of all classes of holluschickie with the cows and pups is complete. It would be a matter utterly impossible to make a "drive" of 100 killable seals from this place to-day and not sweep into that "drive" as many cows and pups and demoralize things generally.

The number of holluschickie out this afternoon is not equal to half of what I observed here day before yesterday, during the prevalence of that southwest gale, which threw up a heavy, furious surf. When the ocean is troubled the breeding seals always haul out in greatest numbers. The breeding seals are quite uniform in their attendance, however, without much reference to weather, unless it be an abnormally

warm, sunshiny day; then the cows nearly all take to the water, leaving their pups with the bulls, behind them. They do not go far away, but lay in the rollers, idly scratching and swimming in the cool embrace of the sea.

I noticed one action this afternoon which has hitherto completely escaped my eyes. A young pup near these "bath tubs" under the bluffs, was eagerly endeavoring to get over the rocks and join those sporting pups which were so joyously splurging in and out of the pools there. But no sooner did the little fellow get fairly started than its mother would lunge after, and, catching the pup precisely as a cat does a kitten, would pitch it rudely back, sometimes full 3 feet at a swing, bumping it without mercy on the bowlders. The pup would then, for a few moments, lay perfectly quiet, then start up suddenly, get a few feet under way for the pools again, when the mother would repeat the lesson just cited. I watched her check and bump this pup of hers against the rocks for nearly half an hour. Then seeing no sign of cessation of this action of the mother, or lack of desire of the pup to have its own way, I did not wait for the ending of the controversy. It shows very plainly, however, that so far from teaching their pups to swim, the mother seals try to keep them from rough water as long as they can, seeming to have an instinctive appreciation of the fact that a heavy swell and surf could and would drown their offspring when so young, should these little creatures happen to get out and within the reach of its breaking force.

GREAT EASTERN.

July 23, 1890.—I passed up above this rookery in going to Tolstoi Mees and the sea-lion rookery this morning. No holluschickie, save a small pod, hauled out. I also observed that the holluschickie have not put in an appearance on the North rookery either—have not hauled since the 20th instant: simply, because there are none left to haul. There are very few seals in the water. No "killer whales" about either. They were here in large numbers up to the 20th of June, then suddenly departed. Captain Lavender informs me that he has seen schools of "killers," hundreds of them, skimming along close to the shore between the village landing and the North rookery; that they have probably gone north into some of the bays there or river estuaries where shoal water permits them to calve and get food: and, then returning this way they hang around these islands for several weeks in October: then leave for the North Pacific; that they suddenly left this island on the 20th of June, this year. I, myself, have not been able to see one of these animals thus far this season: beginning at St. Paul, May 21, up to date.

July 26, 1890.—I made a thorough survey of this Eastern rookery in the morning, since now is the proper time to look for a showing of last years' pups or yearlings. I saw only about 600 of them (500 in one pod and the others scattered). There were also about 100 2-year-olds and a few 3 and 4 year olds—very few.

Some 6,000 pups must have been born on this rookery last June and July (1889), and half of them should be back this summer. Perhaps they will show up better. It is, however, not reasonable to expect to see more than half of them hauled out at any time, even now in the very height of their hauling season. I was much impressed, when viewing them at this time in 1872–1874 on St. Paul, by their habit of ceaseless travel out from, and then back into the sea; i. e., they were constantly coming up from the surf to haul 1,000 or 2,000 feet back, and

others were returning from the uplands, where they had been laying around, to the water for baths and food.

What is left of the cows and pups, as to numbers, on this breeding ground, as well as the other rookeries here, seems to be healthy and free from any visible physical disorder. The most unique feature of this rookery to-day is the hauling of some 450 to 500 sea lions—bulls, cows, and pups—on the surf-washed beach of its sea margin right under the bluffs. The breeding fur seals lay up just above that surf wash, while the huge yellow bodies of *Eumetopias* crowd close up to them from below on a narrow belt which only high water and a stiff wind can dislodge them from. They, however, never haul anywhere else out higher from the water than this, since their young can take to the water and swim in a few days at the longest, after birth.

Not so with the fur seal. Such a location means the death of most every pup born upon it from June until September 15, inclusive, whenever the sudden rising of a gale might raise, in an incredibly short time, a heavy, churning surf. But, after the middle of September the fur-seal pup has become pretty well used to the water and can swim well. Yet, severe gales, in October, have caught even these pups at that time so savagely as to destroy thousands of them, and their lifeless bodies will be thrown high up by the surf to decay on the rocks and sand.

It is a queer sight to see here to-day, those little black fur-seal pups podding hither and thither, rubbing up against the big sea lions in the most fearless and familiar manner, causing those animals no annoyance whatever, and arousing them not a particle. A very queer picture indeed, these small black clusters of fur-seal pups crowding in against the yellow bulk of the big sea lions.

STARRY ARTEEL.

July 20, 1890.—The green growing grasses, flowers, and confervæ that fairly border this breeding ground to-day on this steep bluff slope—this odd rookery—makes a most startling change in its appearance, contrasted as it is in my mind with what it was sixteen years ago. Then a polished hauling ground, fully 1,000 to 1,500 feet deep, encircled the breeding ground, and restless troops of holluschickie in squads of hundreds clambered incessantly up and down the steep, abrupt slopes of Starry Arteel Hill. To-day it looks as though a seal never had pattered over those hauling grounds of 1873: and even now, where the breeders themselves are lying and podding, the ground is not wholly free from scattered vegetation.

The natives assure me that this rookery actually increased in 1876–1878 considerably over my lines of 1873–74; also the East rookery; but to-day it has shriveled up to half its numbers of that time and the East rookery to less than one-third.

Why the breeding seals should elect to haul up on this unusual spot in this queer manner is difficult to positively say, because there is more vacant space at North rookery or Little Eastern than is necessary for the reception of ten times as many as are here assembled. Perhaps, however, the drainage is so perfect that it meets exactly the wishes of the breeding seal, since it is compelled to rest from two to three months upon a single spot ere the work of reproduction is completed.

This rookery (and Zapadnie), are the only ones on this island thus far raided ashore by pirates. That high bluff on which the breeding seals rest, juts north-northeast about 800 feet sharp into the sea from the straight west and east trend of the north shore of the island. This

abrupt projection of the ground makes a perfectly snug shelter from human observation in the village, or from any other point east. There is no rookery and nobody living west of it; and unless one stands upon the extreme summit of the rookery bluffs or west of it, nothing can be seen below.

Behind this Starry Arteel bluff, on its western face, just at and only a trifle above surf wash, is a water-worn cave—a small cavern in which a dozen men can huddle. Here, in 1886 a sealing schooner's crew systematically passed their days in hiding, and their nights in raiding the rookery. They worked some three weeks ere they were detected by the natives, who, in searching along the shore for driftwood, after the sealing season had ended for them, found the freshly-killed bodies of a number of cows at the mouth of this cave: the sealers had departed.

Again, at Zapadnie, in the month of August last year, 1889, a similar raiding of that rookery was attempted; but as the pirates' boats came in at 10.40 p. m. from their schooner, they were fired into, and the startled marauders turned about and disappeared in the fog. Zapadnie has been visited three times prior to this in that manner by pirates; but no great number of seals has been taken by them—a hundred or so perhaps. It is a chosen spot for the mauraders to anchor off from one-half to 1 mile at sea, where they have shot a great many seals. At no other rookery on either island, have they done so to any extent.

At Starry Arteel, in 1886, these cave pirates above described took several hundred skins—some 600. This is the largest haul made by illegitimate landing on either island.

July 27, 1890.—I made a circuit of this unique breeding ground to-day; climbed up through a few scattered pups, cows, and holluschickie, all commingled on its steep hill slope of breccia and cement, which these seals seem to love so well, happy as to drainage, and free from dust.

The podding of the pups here, since the 20th of July, has made the driving of holluschickie simply impossible from this place, for the mixture of all classes is thorough to-day.

I notice, also, that the effect of that peculiar driving (which has been in vogue here ever since the shrinking of 1882 caused its establishment) of the holluschickie is creating an undue extension of sea margin for the number of animals occupying it as a breeding ground. In 1873 this rookery was a compact, oblong, oval mass of breeding seals, 500 feet by 125 feet, in which my figures declared a gathering of 30,000 bulls, cows, and pups; to-day there is a straggling belt of 800 feet by 40 feet (a very liberal estimate) on which only 16,000 bulls, cows, and pups rest.

ZAPADNIE.

July 20, 1890.—I often wondered in 1873, why this little rookery over here, was always the best hauling ground on St. George. I now believe that it is due to its location on the south side of the island, where the scent and noise of the breeding seals must appeal strongly to those bands of holluschickie that are upward bound from the Aleutian passes for St. Paul Island. The largest and best drives are always secured here, i. e., when taken from any one place on the island. The rookery was one of the two smallest on St. George then, and is a small one to-day, and is the only one on the south side of that island.

It was here to-day that the evidence of excessive cow driving (which can not be avoided if the holluschickie are to be secured) was plainly given by our finding in the fresh track of the "drive," made this morning, just as we came on the ground, several pups feebly bleating for

their mothers, who could never answer in time, even if they ever came at all.

This podding of the pups, on and after the 15th and 20th of July every year, makes it simply ruinous to drive a day after that date. The holluschickie now are so few in number that they do not haul out by themselves as they were in the habit of doing when they were in abundance, but mix in at once after they land with the straggling cows and podded pups. As the season advances and this podding progresses the mingling becomes still more and more effected, so that by the 24th or 25th of July it becomes impossible to drive from any rookery margin without getting hundreds of cows in the drive of a thousand holluschickie. Comment is needless; the impropriety of the act asserts itself.

July 24, 1890.—It was off this rookery, September 1, 1874, that the first pirate or pelagic sealer began operations since the seal islands became the property of the United States. This schooner, the *avant courier* of that destructive fleet of 1886–1890, was the *Cygnet*, of San Francisco, Capt. D. Kimberley; and the *San Diego*, of San Francisco, Capt. E. P. Herendeen, was the next craft in order, having paid Otter Island, near St. Paul, a visit of that doubtful character designated as piracy, in 1875.

August 1, 1890.—A careful review of this rookery to-day, disclosed some 1,200 holluschickie: half of that number apart from the cows, the other half commingled with the podded females and their young. Nine-tenths of this squad of holluschickie were yearlings.

I observed, not only here but on all the other rookeries, a strange absence of the proportion of 2-year-olds which should show up now. The fact that 25,000, possibly 30,000, yearlings were killed last year after the 13th of July, may account for this. It simply shows, however, what an empty shell now remains.

The condition of these breeding seals at Zapadnie, barring their scant numbers, is good, physically. The pups and cows have podded out in some places nearly 1,000 feet back, up and away from the sea. These pups on the uplands so far back will not get into the water much earlier than the 1st of next month: while a few on the beach margin are now swimming and learning to swim.

The heavy surf of yesterday and the day preceding has not injured any pups here, as far as I can observe. They are all safely hauled up out of its fury. When, however, they fairly get under way in swimming at first, then such a storm catches thousands of them unawares and destroys them.

ON THE HAULING GROUNDS—ST. PAUL ISLAND.

May 21, 1890.—The first drive for food of the season was made this morning on Seevitchie Kammen by the natives, and about 300 holluschickie were taken. In 1872, on May 14, I made the following note: "First drive of the season made to-day. Some 200 holluschickie from the point on or near the Reef. They drove slowly, but well. Strong northwest wind, and dry." Substantially the same time in arriving now as in 1872.

June 11, 1890.—The first regular business drive of the season was made this morning at 3 a. m. from the crest on the Reef rookery. The natives made this drive of about 1,300 holluschickie, half of it made up of mostly 3-year-olds, some "long" 2 and a few 4 year olds, the balance (a large proportion of it) "long" yearlings and "short" 2-year-olds. The drive was made from the south slope of the crest where, about 150 feet

back from the surf on the rocks, these animals had hauled, having slipped in between the breeding bulls which are widely scattered there on the sea margin. This ground, when visited by myself four or five hours later, was filling up again with holluschickie, showing clearly that the act of visiting and driving from this point early this morning, has had no effect in preventing or delaying the continued hauling of this class of seals. Five hundred and thirty-nine skins taken; 60 per cent rejected.

These old bulls, by the way, on the rookeries behave now as they did in 1872, precisely. They are a little shy and sensitive when they first haul up in May or late in April, and for the next ten days thereafter; but by the 15th to the 20th of May they have become so settled that they will not leave their positions, but boldly face and defy you when you walk down to them to inspect their lines of hauling. Not a single bull on any one of these seven breeding grounds of St. Paul, from the 22d of May up to the hour of the completion of my survey of them, manifested the least fear of my presence when I was in their immediate vicinity.

There are, however, always a number of bulls that haul on the outskirts of these well-defined rookeries which I term "vagrants," because they have no location or nerve. These bulls will scuttle away precisely as the holluschickie do.

June 15, 1890.—During the last ten days, while inspecting the land angles, and bulls on the several breeding grounds of this island, I have paid careful attention to every squad of holluschickie that has appeared: and, except as to numbers, I do not observe any change up to date in their habits, or of hauling early in the season, from my notes of 1872.

These early squads appear just above the surf margin in English Bay, just in back of the breeders on Lukannon, Ketavie, and the Reef. They are captured by the natives just in the manner I described as characteristic of the work so early in the season of 1872, and they are driven overland also in the same method, except that the drivers use whistles occasionally, instead of bones, grass, etc., to start the lagging herd.

There is not much change, however, in the method of handling the skins after they are taken, which is also done exactly as I have described it. A white man now supervises the clubbing. Now a team of mules and a full-sized Studebaker farm wagon is busy in carrying the skins from the field to the salt houses; and two men easily do this part of the work to-day, which required all hands to do, in 1872. In 1874, carts and mules were first employed for this purpose, and these teams aforesaid, soon followed.

At 8 a. m. a report came down from Northeast Point which declared the presence of two marauding schooners up there, with their boats down, sealing. This is the first notification of the kind for the season. Mr. Goff and I started at once for Novastoshnah with four selected men. I went with him because, independent of the legitimate errand, I desired to personally experience a ride upon a two-wheeled cart, as he rode in a gig drawn by a team of mules. The road is bad, very bad, and will require considerable work laid out on it before it is fit even for slow driving over in any vehicle. Thus far, the mule-back ride is best: and, after all, I prefer my own legs.

We arrived at Webster's house at 12.30 p.m., after traveling against a stiff northeast gale charged with rain and hail the whole way. The two natives stationed there, on watch, were not clear in their understanding of the vessel which they saw yesterday; because it was at one time a "steamer," and at another a "schooner," etc. We came to the

conclusion that it was, and is one of the several steam whalers that are known to be cruising in Bering Sea this season.

Peter Peshenkov, one of these watchmen, said that yesterday was a fine day, still, and semiclear. He went around the entire circuit of the rookery, carefully inspecting the sea margin. He says that he found about 200 holluschickie hauled immediately up on the north side of Sea Lion Neck. He says that nowhere else was there any holluschickie, except a few polseecatchie on the beach just below the south shoulder: and, everywhere else, outside of the straggling old bulls, nothing. Peter and Carp Booterin came into the house during the afternoon while the storm was in progress, and talked to Mr. Goff and myself freely over the condition of this rookery, as well as the others.

June 16, 1890.—Webster House, 9 a. m. Carp Booterin and Neon Mandriggan made a circuit of Northeast Point this morning. They report to Mr. Goff no sign of vessel landing or sealing anywhere on the circuit. They say that there are about 300 holluschickie on the Staff Bight: about 200 good ones on the north slope of Hutchinson Hill, and a few, very few, at or near the South Shoulder. I came down on foot to the village, giving Polavina a survey along outside, so as to see the old and new seal grass on that famous parade. It is somewhat too soon to arrive at a conclusion: but what I saw, and noted, causes surprise.

Suppose you had, sixteen years ago, stood on an eminence overlooking a sheep pasture three-fourths of a mile in length and one-fourth to one-half a mile in width: this lot filled with a flock of sheep so full as to fairly whiten with their bodies the whole surface of the green earth upon which they slept, grazed, and stood in groups. Then to-day to stand again upon the same eminence, overlooking the same ground and life, and see nothing but a few lonely, wide-scattered bands of sheep, and these so few in number that it requires no effort to count them one by one. That desolate impression made thus upon you, is precisely the impression that these hauling grounds of St. Paul Island make upon me to-day. Perhaps the next month may improve matters, but Mr. Goff says that it will not.

June 17, 1890.—I made a review of the abandoned site of Nah Speel rookery this morning. The last bulls and cows hauled here in 1886. In 1872–1874 there were some 8,000 bulls, cows, and pups here, with 400 feet of sea margin, 40 feet deep. In 1876 they had fallen off to less than half that number, having gone over across the way to Lagoon rookery.

This abandonment gives me a good basis for an estimation of the time it takes for nature to remove the traces of seals hauling on the rocks. These rocks of Nah Speel rookery, under my feet this morning, were in 1872–1874, so polished by the flippers of *Callorhinus* that nothing save the shiny basalt, olivine, and gray lava was to be seen; to-day, they are literally covered with yellow and gray lichens: and, were it not for the evidence of those seal-grass tussocks up above them, a practiced eye would not, could not, suspect the previous existence of a breeding rookery on them. And this all effaced in less than twelve years, partially by the lapse of the first six, then wholly within the last five years. How important it is, therefore, to have these breeding grounds correctly surveyed at frequent intervals: so that ebb or flow of this seal-life tide can be truthfully registered. Certain it is, nothing can be definitely trusted to memory in this respect.

June 17, 1890.—On the Reef and Garbotch. *Where are the polseecatchie, or half bulls?* Where, indeed, are those young 5 and 6 year old bulls which were literally swarming at the water's edge of these

breeding grounds in 1872, trying to land and repelled in vicous battle offered and waged by the old bulls? *Then, thousands and thousands of these young bulls were incessantly essaying to land on the rookery sea margins*, and were as incessantly fought off by the elder, heavier seecatchie then in possession of the water's edge.

I have been carefully watching the field this morning, on these two great breeding grounds. The cows are arriving; and, it was at this time and occasion, in 1872, that the polseecatchie appeared, as I have above noted. *But, not a single example presents itself to my eye this morning.* Where are these young bulls which must step in next year to supply those vacancies which the law of nature is to create in the ranks of the old bulls? These seals are not here to-day; will they appear later?

There has been no change in the numbers of the old bulls on the rookeries since the 10th instant: none whatever; and there are frequent intervals on these sea margins to all these rookeries where vacancies exist from 15 to 40 feet wide between the located old bulls. Thus every inducement is offered to a young bull to land without the fear even of being obliged to fight savagely, which must have prevailed in its mind in 1872, and which then, did not deter it from incessant attempt to land on the breeding ground.

Are these young half bulls all gone? If so, then everything else will soon follow, unless the check is applied. Then, again, in this connection, let me put it on record as I come in now from the field that *none of the scattered bulls now hauled out on the rookery grounds, are those known as half bulls, or polseecatchie.*

Only 78 skins taken from the drive at Northeast Point to-day. First drive of the season up there.

June 19, 1890.—I ascended the basaltic ridge between Lukannon sands and the village lakes this morning between 8 and 9 o'clock. *Not a single seal, old or young, on these hauling grounds and sands of Lukannon.* From the summit of Telegraph Hill I had a full sweep of English Bay. Only a small squad of perhaps 150 holluschickie under Middle Hill, and another small pod at the intersection of the sand beach with Tolstoi rookery.

A small drive from English Bay was made yesterday; some 300 skins taken. The first drive from Northeast Point yesterday gave only 78 skins. Whether this trouble begins on the rookeries or on the killing grounds, I have to find out, and it is important to know.

Not a single holluschak of any age whatsoever on Zoltoi sands this day, and there has not been a killable seal thus far there this season.

June 21, 1890.—From the high sand dunes of Tolstoi, I have a full survey of English Bay. A few hundred holluschickie only, under Middle Hill: and right down under me at the intersection of the sand beach with the breeding ground of Tolstoi, are a few more, 200. The weather has been good for hauling ever since the last drive (17th) from this place, yet it has not filled up any better than this.

From this time on, the killable holluschickie should appear in as good or better number up to the Fourth of July—better form than they will thereafter. In other words, the best classes of these killable seals, viz, the 2, 3, and 4 year olds, were here, now, in their finest form and number for the year, during the seasons of 1872–1874.

From the Volcanic ridge I had a clear view of Lukannon beach and hauling grounds. Not a seal of any age upon it, and the weather superb for seals to haul in—cool, moist, and foggy.

Sunday, June 22, 1890.—Fine weather for hauling continues, but the

A drawing from nature by the author

PLATE 42.

FUR-SEALS HAULING ON THE REEF PARADE GROUND, SAINT PAUL ISLAND, SEPTEMBER 20, 1872.

This was an every-day sight on this ground sixteen years ago, between the 25th of June and the last of September; it so continued until 1879. The seals in the foreground are "gray pups"; the mist is caused by the hot breath of the seals—a seal breath fog.

seals do not haul. Not a single seal on Zoltoi sands this morning. There has not been a holluschak there up to this date. This spot was the never-failing resort of the natives in 1872–1874, according to my own observation. Sometimes two drives of thousands each would be taken, one right after the other, in the same morning, from this place right under the village, at this time in June. Every seal would be swept off from the sands of Zoltoi, then in the early hours of a morning like this—a drove of anywhere from 3,000 to 5,000, and even more holluschickie of all sizes and thousands permitted to hustle into the water at the moment of driving. Then after breakfast, at 7 o'clock, I would again go up to look, and behold! these sands of Zoltoi, which only a few hours earlier *were swept bare of every seal*, were *now fairly covered* with a fresh swarm of holluschickie; and which, later in the day, might be driven up to the killing grounds not more than 1,000 feet away, provided that the day was a favorable one for work, and the men on the killing grounds were not unwilling to meet the increased labor.

Now, not a single young male seal has hauled on Zoltoi thus far this season (June 22, 6 a. m.). This is the day and hour of the season in which to see the holluschickie in their best form and number as to all classes, except the yearlings. Therefore, this vacancy on Zoltoi sands, on Lukannon beach, and the uplands of Volcanic Ridge, on Ketavie uplands, on the sands of English Bay, on those of Polavina, and the utter solitude of those of Southwest Point and of Novatoshnah makes a deep impression on one who has, like myself, stood upon them all in 1872–1874 and observed the swarming platoons of young male seals then existing—now entirely vanished.

Yesterday, when the work on the killing grounds closed, only 3,010 skins had been taken, and every little squad of holluschickie that has showed itself above surf margin on this island has been secured to get even this pitiful number. The same ruthless driving in 1888–1889 secured, in the same time, thirteen thousand odd skins. At this rate of decrease, of less than one-quarter, and the season for hauling far better than it was last year, what indeed will be the catch next year? Not more than a few hundred. These are facts which the status of the hour declares and which can not be sensibly overlooked at this finest season of the catch.

Then, too, the utter shift of method in driving which characterizes the present from the past. Now, with the solitary exception of the small drives from Middle Hill, every drive has been right from the borders of the breeding rookeries—from right in and among the old bulls as they lay in waiting for the incoming females. This fact in itself is a most eloquent pointer to the truth—to the utterly depleted condition to-day of these hauling grounds and their abundant reserves of 1872–1874.

At this time in 1872–1874, inclusive, I never glanced over at Zoltoi sands but I saw holluschickie coming and going from and to the sea in steady files and platoons. I never looked over the broad sweep of English Bay beach from the high sand dunes of Tolstoi but to see the same sight, only in vaster, greater form and numbers. So, too, as I viewed the beach and volcanic ridge of Lukannon Bay and at Polavina it was an impressive spectacle: and the sand reaches of Northeast Point were simply alive with the restless multitudes of holluschickie that were hauling out there, and into the sea.

I do not observe to-day, except at Middle Hill, the least, the faintest suggestion even, of that past. Will it improve? The 20th of July will tell the whole story beyond speculation or cavil.

Sunday afternoon.—From the fact that this morning opened warm, clear, and with bright sunshine, I did not expect to see any hauling of the holluschickie. It has been the first day since the 12th instant, that has not been suitable for hauling. The weather hitherto, has been excellent. Lukannon beach is as bare as it was yesterday, and the two small pods at English Bay remain at the close of the day, just as they were hauled yesterday—no more of them. I rather expected to see them all in the water, since it has been so warm, the first warm day of the year: but they were not.

It thickens up this evening and becomes cool. Not a seal on Zoltoi sands this morning, and not one seen during the day.

Monday, June 23, 1890.—Those two pods of holluschickie, which I have observed under Middle Hill and Tolstoi during the last two days, were driven up this morning. I began an itemized account of percentages—the number driven up in each pod, and the number turned out to the sea or rejected from it.

Pod.	Number driven.	Number taken.	Pod.	Number driven.	Number taken.
1 *a*	.....	.....	7	61	15
2	79	9	8	50	15
3	27	7	9	47	7
4	37	8	10	39	9
5	61	15	11	46	6
6	46	10	12	69	9

a Pod No. 1 I did not get a correct count of, so it is omitted.

Eleven pods of 561 animals driven up; 110 of them killed or one-fifth taken, *or 80 per cent* turned away! All under 7-pound skins, with the exception of a few wigged 4-year-olds and a dozen or two old bulls. This gives a fair average of the whole drive to-day, some 2,500 animals, since 518 only were taken. At this time in 1872, with the same standard of nothing under 7-pound skins, *only 10 to 12 per cent* were turned away!

To-day all the seals taken, with the rare exceptions of a few 4-year-olds (11-pound skins), were 3-year-olds (7½-pound skins). Not one 4-year-old in twenty taken, and a remarkable absence of 2-year-olds.

Those turned away (nearly 2,000) were 95 per cent at least, "long" and "short" yearlings. A few 5-year-old, and a very few 6-year-old bulls. A very, very few 2-year-olds also.

A small pod of holluschickie made their appearance close up under the bluffs of Zoltoi, 100 to 150 of them, at about 11 a. m. This calls to my mind, Where have those tired seals gone which were driven this morning, and let loose from the pods on the killing grounds into the Lagoon slough, from there, direct to the sea? Where do they go? Do they haul up again? Yes, everybody says so: and I do not know anything to the contrary, and do know a great deal in affirmation. Then, if that be so, *these seals spared to-day may be driven to-morrow:* to be *spared again, and driven next week, and so on all over the island through the season.* What indication, then, really, have we of what number of *fresh holluschickie* really arrive from this time forth, if these released seals are to continually present themselves anew as they do? So, as matters go, we will note the steady increase daily, of discarded seals in the drives, together with the new arrivals or freshly driven seals, throughout the killing season.

In 1872–1874 this proportion of rejected or turned-away seals from all the drives up to the 1st of July was not over 10 or 12 per cent of the whole number driven. Now it is between 70 and 80 per cent; and 95

per cent of the rejected yearlings will require six years of rest ere they are fit for rookery service. This is the status at the present moment on these killing grounds, and this also must be considered in the light of the natives' positive declaration in 1834, that this repeated driving renders the spared male seals wholly unfit for rookery service.

How many of these released seals this morning have been driven over this road before this season? On the 17th instant the last drive prior to this one to-day, was made from Tolstoi and Middle Hill. Seventy per cent of that drove was turned away; and now, to-day, the same ground is driven from again, and 80 per cent is turned away. I shall observe the rest of the drives very closely. At this rate of increase, where will the driving be in July, when the yearlings then begin to haul in bodies?

June 24, 1890.—A drive this morning from Zoltoi bluffs of about 500 all told, and also pod from the Reef, 750 coming. Yesterday morning at 7 o'clock, there was not a single holluschak out on Zoltoi bluffs: but in less than three hours after the killing began on the Lagoon flats, and the turning out from the pods there, I observed that holluschickie were hauling under the bluffs at the intersection of Zoltoi sands, the first that have hauled there this year. They drove from there on the 14th instant last year. Now, the query can not leave my mind, Were any of those spared seals of yesterday hauling up soon thereafter at Zoltoi? Look at the map and observe the significance of the surroundings. Everybody in 1872 and everybody to-day admits that these seals which we released from the drives haul up again, are driven over, released, and still driven again and again throughout the season. In 1872, on this St. Paul village killing ground, such a 5-year-old bull was pointed out to me by Chief Booterin.

At 7 a. m. I went down to the killing grounds and followed the podding and clubbing of the entire drive brought up from the Reef crest and Zoltoi bluffs this morning. The Zoltoi pod arrived on the ground long before the Reef pod—two hours sooner. It was made up largely of polseecatchie and yearlings, the oldest bulls of the season, 6 and 7 year olds: and, 17 in this pod were many bulls which the natives said had come over from the Lagoon killing yesterday. They knew them as they pointed them out to me by certain clubbing marks.

The following are field notes of the podding and clubbing of the drive made from Zoltoi and the Reef June 24, 1890.

[Killing began at 7 a. m., ended by 9.30 a. m.]

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	53	13	6	21	28	12	1
2	39	14	4	22	34	9	3
3	41	12	2	23	25	6	2
4	48	12	3	24	36	11	5
5	27	11	3	25	47	15	4
6	54	20	4	26	50	12	3
7	30	15	3	27	29	9	4
8	42	10	4	28	34	7	3
9	52	12	3	29	17	7	1
10	40	16	2	30	37	8	4
11	39	13	3	31	20	8	2
12	27	7	1	32	52	11	1
13	36	10	2	33	38	10	.....
14	61	14	7	34	46	14	.....
15	46	10	3	35	24	9	.....
16	40	10	5	36	28	15	.....
17	35	9	3	37	30	15	.....
18	36	14	6				
19	35	12	4	Total	1,366	426	96
20	38	13	3				

Seventy-one per cent of this drive was rejected. Every 3 and "smooth" 4-year-old taken, and every "long" 2-year-old. Nothing under or over that grade.

The seals released this morning were exclusively yearlings, "short" 2-year-olds, and the 5 and 6 year old half bulls or polseecatchie. No "long" 2-year-old escaped, and so, therefore, many 5½ and 6 pound skins will appear in this catch. There was a notable absence, however of 2-year-olds in proportion, and the bulk of the catch was 3 year-olds, as was yesterday's killing with a very large number of 4-year-olds in proportion to the whole number of skins taken.

In the afternoon I took a survey of Lukannon Bay and its hauling grounds. Not a seal on the beach, except a half dozen half bulls abreast of the Volcanic ridge. Thence over to Tolstoi sand dunes, where I saw about 600 or 700 yearlings, conspicuous by their white bellies, and a few killable seals sandwiched in another small pod under Middle Hill.

The only record which I can find of any driving upon land to slaughter other seals than the fur seal is the curious relation in Charlevoix's account of his voyage to North America (*Journal of a Voyage to North America*, vol. i, 1761, pp. 222–226). Speaking of the seals of the Gulf of St. Lawrence, under date of March 21, 1721, at the close of a rather lengthy but quaint description of them—"sea wolves," as Charlevoix calls the *phocæ*—he says: "Lastly, I have been told that a sailor having one day surprised a vast herd of them ashore, drove them before him to his lodgings with a switch, as he would have done a flock of sheep, and that he with his comrades killed to the number of 900 of them. *Sit fides penes autorem.*" This is the only authenticated (?) record which I can discover of any driving of the *Phocidæ* to land killing grounds away from ice floes or the sea margin.

The sea-elephant, *Macrorhinus*, is driven, it is true, but *only a few yards inland* from the subtropical beaches of California or the forbidding shores of Antarctic Kerguelen and Herd's islands. Like the the hair seals, they are usually knocked down wherever they are surprised by the sealers. I think the seals above alluded to as driven by Charlevoix, were *Phoca vitulina* or *fœtida*.

I should remark that the driving of the seals has been very carefully done, no extra rushing and smothering of the herd, as was frequently done in 1872. Mr. Goff began with a sharp admonition and it has been scrupulously observed thus far by the natives. This dropping of exhausted seals along the road in 1872–1874 was a matter which then aroused both Lieutenant Maynard and myself in 1874. The agent of the Alaska Commercial Company then promised to correct the evil. But it will always require the eye of the Treasury agent to rest upon this feature of the business since he is the executive head in this small community, unique and isolated, and he should be.

June 25, 1890.—An inspection of Zoltoi Beach this morning, does not show a single seal upon this famous hauling ground. Yesterday morning, a small drive of considerably less than 500 was taken from the rocky eminence just to the southward of this spot, being also the first drive made from there this year. When driven in such fine sealing weather as that now prevailing, in 1872–1874, these sands in less than an hour afterwards would begin to fill up again with fresh arrivals from the sea: and often, after the lapse of seven or eight hours after the first drive had been made, to meet an additional demand, another drive would be ordered from the same spot and duly driven. I did not see this morning a single seal sporting in the waters of Zoltoi Bay, and the only

PLATE 43.

A drawing from nature by the author.

LUKANNON SANDS, SAINT PAUL ISLAND, JULY 7, 1890.

View looking up to Stony Point from the foot of Lukannon rookery. In 1872 these sands were fairly alive with hauling bachelor seals; in 1890 the best exhibition

one in sight was right under the village bluffs where I stood by the flagstaff.

June 25, 1890.—I went up at 6 a. m. to the killing at Tonkie Mees, or Stony Point, where, *ever since 1879, the seals that have hauled at Polavina, and on the sand beach between and toward Lukannon below, have been driven for slaughter.* A small herd collected this morning, and only 263 taken. The balance, some 500 or 600, were turned back to the sea. The selection was made in the same manner as yesterday, and the same class of seals spared. *An enormous number of 5 and 6 year old bulls were in it for the whole number driven,* even greater than that I recorded yesterday. I tallied these pods thus: Pod 1, 76 driven; 9 taken, all 3 and 4 year olds. Pod 2, 35 driven; 9 taken, all 3 and 4 year olds. Pod 3, 56 driven; 16 taken, all 3 and 4 year olds.

Then, after the killing gang had finished and started to return to the village at 8.30 a. m., I proceeded up to Polavina, following the seal-drive path made by the natives early this morning. I observed at Stony Point, or Tonkie Mees, the spared seals, as they were released from the pods, plunge back into the surf, and to my surprise most of these seals headed directly back for Polavina, jumping in rapid "dolphin" leaps and swimming rapidly. As I walked along I repeatedly stepped up on to the summit of a sand dune, and continued to watch the progress of these liberated herds. They all pointed directly for Polavina, and filed right along in swift procession, passing me continually as I walked in the same direction. When I came up to my land angle, Station C, I saw these small seals, liberated only a few hours ago at Tonkie Mees, beginning to haul anew at Polavina, from whence they had been driven overland early this morning. They were lured up as they returned, just below the rookery ground proper, on a broad sand beach by the large number of somnolent, apathetic bulls that are stretched out here in a confused medley, all quiet, however, or heavily sleeping.

From this station (C) I could easily see distinctly that last remnant of the zapooska at Stony Point, 2 miles below, creeping down into the surf, then heading toward me, join the others, all swimming up along shore just outside of the outer breaker margin of the rollers, up to that point of retarding, as I have stated above. Thus, in this way, for the first time, I have seen an unbroken circuit of released seals as it plunged back into the water and hauled out again, within the space of three hours from the time of the release until the landing was made anew.

The present poverty of these celebrated hauling grounds of Polavina is well illustrated by the catch from the drive of to-day—only 263 skins. At this day and date in 1872 I could have driven from the great parade plateau behind this breeding ground, under precisely the same circumstances surrounding the drive of to-day, 10,000 killable seals, not one of them over 4 years old, and not a single one of them under a good 3-year-old, i. e., all 8 to 12 pound skins. Comment is unnecessary.

Yesterday, from the summit of Volcanic Ridge I saw three released holluschickie sporting in the village lake, right under my feet. They seemed to be thoroughly happy; were lolling on their backs with their flippers lazily held up or turned up and over on their chests, scratching, etc. I sat down and watched them sport for some ten minutes. This morning while on my way up to Stony Point and Polavina I saw that one of them had died—its body laid just awash at the water's margin: and, only one of the other two was remaining in the lake. Now, certainly, this particular seal died last night from the strain or effect of that drive overland from Tolstoi or English Bay, in getting over here from that

point, for it was driven this far from there on the morning of the 23d instant. So, again, this question keeps rising, *How many of these driven seals that are released finally die of internal injuries received during their overland trip to the slaughtering grounds?* and *How many of them really live well after they have been redriven in this manner, many times from these several hauling grounds of St. Paul?* More and more forcibly arises to my mind the statement of the natives in 1834, who assured Bishop Veniaminov that the young males driven here and spared, never became fit afterwards for breeding purposes, and never, after this driving, went upon the rookeries.

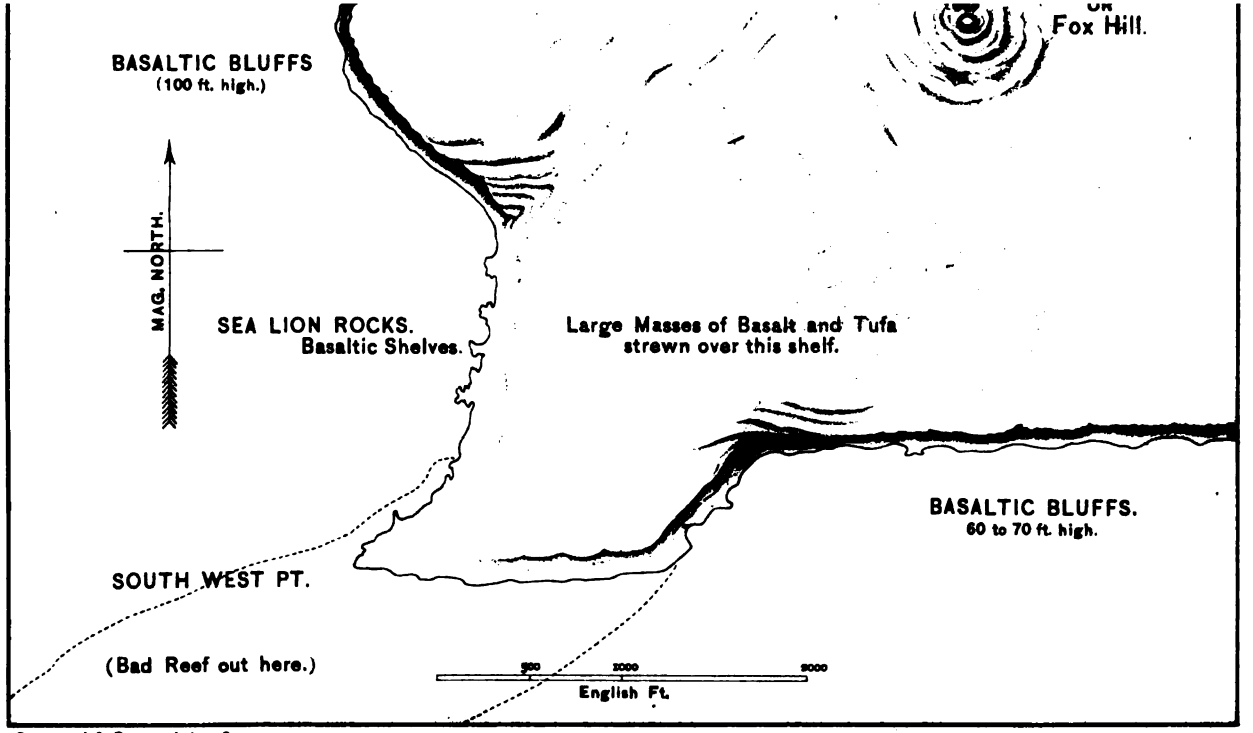
Certainly, it becomes clearer and clearer to my mind, *that those young males, which as yearlings, survive the driving here of that year of their age,* and then return *to survive the driving of the second year of their age;* then, surviving this trial, *reappear to be driven over again in their third year,* to be released *and again, if alive, to be redriven up here in their fourth year,* and then finally, *if surviving these five consecutive seasons of unwonted violent physical effort,* unnatural efforts, to be *again driven, as I see them to-day, in their fifth year of growth, what, indeed, can we reasonably expect of them in their sixth year!* even if they do manage to endure (some of them, not many of them) all of this intense physical suffering, exhaustion, straining of tendons, congestions of lungs and brain, and heart suffusions. The more I think over this matter the more I believe that the natives were right: and Veniaminov says that they "truly assert" it.

I had this point in my thoughts during my studies of 1872–1874; but at that time, *no holluschickie were driven from Southwest Point, from Zapadnie, from Tonkie Mees or Stony Point, or from Polavina;* no seals were driven from these places, where everybody admitted that full half of the entire number belonging to the island congregated: and, then the percentage of rejected or turned out seals on the killing grounds, was really very small. There was not much wasted energy: most of the seals driven then, were killed, and duly skinned.

Therefore, it did not then impress me. It seemed immaterial: for, there was an immense reserve of undriven, undisturbed young male life. The natives themselves said that all was well, *even if those spared seals of 1872, never went to the rookeries.* How different at this writing. In 1879 the distant driving began here: and that marks the date of the decline of the hauling grounds. At the rate of decrease up to the present wretched order of affairs, it will now require seven years of unbroken rest on land and sea to bring back a condition such as I found and recorded here in 1872–1874. *Perfect rest must be given here on the islands, and full protection in Bering Sea.*

June 26, 1890.—Not a single holluschak or half bull on Zoltoi sands this morning, and there has not been one near it since that sweep of 500 half bulls, or yearlings, made there on the morning of the 24th instant. This time in 1872, it would have been overrunning with seals from the bay clear over to the summit of Gull Hill, even if driven clean every morning! The sealing weather here, since the 1st of June, has simply been perfect; it is as fine as could be desired; and yet, the astonishing poverty of these empty hauling grounds is sought to be ignored in certain quarters. A hundred gifted tongues, speaking in emphatic harmonious accord, could not tell the story of destruction better than those vacant sands of Zoltoi, as they appeal to your eye and understanding this morning.

I walked over to the Zapadnie killing grounds this morning, arriving



Surveyed & Drawn July, 1872
by Henry W. Elliott.

HAULING GROUNDS AT SOUTH WEST POINT.

H. Doc. 175, 541.

St. Paul's Is^d Pribylov Grp.

SEASON OF 1872.

No Seals have hauled out here to speak of since 1884, none whatever, landed in the Season of 1890.
The whole Area above indicated now covered with Sod and Flowers.

there about 9 o'clock. The drivers had collected a squad of about 340 holluschickie, which were clubbed thus—

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	30	12	2	7.....	53	12	4
2.....	37	13	1	8.....	47	12	1
3.....	56	11	9	9.....	18	6	5
4.....	40	15	2				
5.....	23	9	5	Total.	344	97	30
6.....	40	7	1				

or about *72 per cent unfit to take*, being made up chiefly of yearlings, "short" 2-year-olds, and "wigged" 4-year-olds, and 5-year up to 7-year-old bulls. Of this latter class of half bulls, an enormous percentage in this small drive appears.

Now, this little drive was not taken from the regular hauling grounds of these holluschickie, as I knew them in 1872, but from the immediate line of the rookery on Lower Zapadnie, at a section about midway between the point and the sand beach. The weather can not be blamed for the small killing to-day; it is simply superb sealing weather, and not a word against it was uttered by the disappointed sealers this morning.

Nearly every one of these released or spared seals this morning returned at once to the rear of the breeding bulls on Lower Zapadnie, right under our eyes. They refused to return to the sea, although the path was open to them and the distance was less. They will all be driven again in the next visit, plus the new arrivals which may come along between now and then. Ah! this driving and redriving; its full significance is beginning to appeal to my understanding successfully.

That pod of holluschickie, which I have seen under Middle Hill during the last two days, still lies there, and also that one next to the clustered cows on the sand at Tolstoi. They will drive it to-morrow. Thus far no holluschickie have hauled out 50 feet above surf wash, except where they are found in back of the rookery margins, as the Reef crest, Zapadnie, and Northeast Point, where the breeding bulls drive them back some 150 to 250 feet. In English Bay, to-day, eighteen years ago, *the holluschickie were hauled by thousands upon thousands back nearly half a mile* everywhere upon the soil, sand, rocks, and grass of the uplands; to-day, *not a sign of a seal there* except the handful down close by the surf under Middle Hill!

June 27, 1890.—The drive to-day from Middle Hill, Tolstoi, and Bobrovia Yama (of Tolstoi near the point) panned out as follows. This is the result of saving the drive ever since the 23d instant:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	108	14	.....	17.....	53	13	3
2.....	82	13	1	18.....	40	4	.....
3.....	57	12	.....	19.....	60	15	.....
4.....	56	11	.....	20.....	49	13	2
5.....	68	12	3	21.....	63	16	3
6.....	34	3	2	22.....	45	15	.....
7.....	58	12	.....	23.....	59	15	1
8.....	60	15	2	24.....	41	14	.....
9.....	54	16	2	25.....	44	15	.....
10.....	53	13	.....	26.....	50	18	.....
11.....	73	15	.....	27.....	53	17	3
12.....	55	8	.....	28.....	42	15	.....
13.....	54	12	2	29.....	50	22	.....
14.....	61	20	.....	30.....			
15.....	81	16	.....				
16.....	49	10	.....	Total..	1,652	394	24

Deduct 24 overcounted, leaves the whole number of animals driven, 1,628; number taken, 394, *or 78 per cent rejected.* Nothing taken under a 6-pound or "long" 2-year-old skin.

Thus this drive, in the very best of the season, shows that 78 per cent had to be rejected. Now, those little fellows, which were turned aside here on the 23d instant, will be out again in a few days to be redriven, plus those that are released to-day, plus all the rest to be released likewise—they will be all up in July. What will these drives be? Sixteen of the 394 skins taken in the killing grounds, as above cited, were rejected in the salt house by the company's manager because they were too small. They were normal 2-year-olds, 5½-pound skins. Perhaps, they will be glad to get them later.

In 1872–1874 very little attention was paid to driving seals until the 12th to the 14th of every June. True it was that bands of thousands of holluschickie were hauled out on the several resorts, yet because these animals were not in comparatively great numbers, and were nearly all down at that early date by the surf margin, it was deemed best to wait until the 12th to the 14th before beginning in earnest to drive; but after the 14th of June there was always such an abundant supply of holluschickie on hand within a mile and a half of this village and Northeast Point salt house, that no concern was ever given as to the number that they could get. It was just the other way; if it was a warmish, dry day, then a small drive only was made, so as to secure some 1,200 or 1,500 skins; if it was a cool, favorable day, then some 2,500 or 3,000 skins would be taken, which latter figure was the utmost number that the working force at the village could handle under the best circumstances in one day. How different this year. On the 6th of June the most eager, energetic driving began simultaneously with the arrival of each and every squad of holluschickie big enough to warrant it, and it has been kept up unremittingly until the present hour.

The spared seals turned away this morning were saved by their small size. Only 24 of the whole 1,628 in the drive were 5 and 6 year old bulls. Every "long" or well-grown 2-year-old was taken (6-pound skin) and every 3 and "smooth" 4-year-old.

Not a holluschak or any other class of fur seal on Zoltoi sands this morning or noon. I watched the progress of the released seals this morning as they came out over the Lagoon slough and rookery. Most of them swam directly out to sea, not heading in any particular way except from land. A few swam under the village hill bluffs, and thence out across in the direction of the Reef, and a few headed back for English Bay. *Not one of them started for Zoltoi, as they did on the 23d instant.* On that occasion it was the hauling of some 50 half bulls on Zoltoi that lured, perhaps, the younger seals out after them. They were released together at the same time on the killing grounds.

This afternoon, I took another survey of Lukannon and Tolstoi, and the vacant hauling grounds of English Bay and the Volcanic Ridge. Another small pod of holluschickie at Middle Hill, from whence they drove last night for the day's killing, and another adjoining the podding cows on the sand beach at Polavina: about 250 or 300 in both pods, and chiefly yearlings.

June 28, 1890.—The superb sealing weather still continues. The natives are bringing up a small squad from the Reef as I write (5 a. m.).

The following are field notes of the podding and clubbing of drive from Reef and Zoltoi bluffs, June 28, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	71	13	3	14	73	7	.....
2	75	19	.....	15	85	15	.....
3	80	14	3	16	49	7	.....
4	46	3	1	17	54	4	3
5	80	8	.....	18	66	9	2
6	62	8	1	19	63	10	.....
7	50	10	1	20	46	7	6
8	40	5	2	21	74	10	.....
9	55	8	.....	22	43	6	.....
10	45	7	4	23	40	8	1
11	56	10	.....	24	52	10	4
12	52	4	.....				
13	60	5	1	Total	1,417	203	27

Whole number of animals driven, 1,417; number taken, 203, *or 85 per cent turned out.* Last drive from this place, June 24, *71 per cent turned out.* Everything taken in this day's killing above a normal 2-year-old, and under 5-year-olds and "wigged" 4-year-olds, i. e., all 6-pound skins and upward.

June 30, 1890.—The following are field notes of the podding and clubbing of drive from Middle Hill,[1] English Bay,[1] Tolstoi,[1] Lukannon,[2] and Ketavie:[3]

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	108	11	6	13	56	4	.....
2	39	5	.....	14	55	15	2
3	41	6	4	15	63	15	2
4	69	12	4	16	77	10	5
5	53	8	1	17	70	9	4
6	40	10	1	18	47	12	5
7	53	10	1	19	49	9	1
8	47	14	4	20	46	10	.....
9	58	6	1	21	48	6	5
10	58	8	.....	22	81	6	.....
11	51	10	.....				
12	53	7	.....	Total	1,262	203	50

Whole number of animals driven, 1,262; number taken, 203, *or 84½ per cent rejected.*

The small contingent from Lukannon and Ketavie, numbered less than 300 animals, before merged in the single drive. Everything taken that was above 5½-pound skin, and under those of the 5-year-olds and "wigged" 4-year-olds.

The significance of this day's work can be seen by the most casual observer. I counted over 24 blind-eyed or "moon-eyed" holluschickie as they escaped from the several pod "zapooskas," all of which had been crippled in this manner by prior driving this season. How many of these yearlings and "short" 2-year-olds that were released this morning will again be driven before this season ends? Nearly all of them. They pass into the sea over the Lagoon Bar; they meet squadrons of cows playing in the water around the rookery margins; they pause, lis-

[1] Last drive from these places, June 27, and 70 per cent turned out or rejected.
[2] Last drive from this place, June 20.
[3] First drive from this place.

ten, join in the general comfort which the water certainly affords them, and as these females and the fresh animals of their own kind haul out on land they join again and fall into this deadly procession to the land from whence they were driven early this morning. How the significanec of this driving now keeps rising to my mind! I had little occasion in 1872–1874 to give it thought, and what I did was only in a suggestive mood.

I passed up from the killing grounds over to Tolstoi rookery and gave the drivers' path or seal road a careful review. A few holluschickie were again hauled out under Middle Hill and a dozen perhaps on the Tolstoi rookery sand intersection; but the great hauling grounds of English Bay are utterly destitute of seal life at the hour of this writing and have been so, with the marked exception of that small spot under Middle Hill and the juxtaposition of Tolstoi rookery, which are the only points where the seals now haul in all that vast extent of ground pattered over by them here in 1872–1874.

Not any holluschickie on Zoltoi sands to-day, and only one or two on the rocks beyond and above, from whence they have been driven thus far, as Zoltoi seals. Mr. Goff assures me that there was no driving from the sands here last year; it was all from these rocks above. When this famous hauling ground began to fail was the time for the note of warning to have been sounded. When did it fail?

July 1, 1890.—The following are field notes of the podding and club bing of drive made from every section of the reef, everything in back of Zoltoi Bluffs, Garbotch, and the entire circuit of the reef.

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	109	15	2	18.....	49	6	3
2.....	51	4	1	19.....	78	4	4
3.....	77	12	1	20.....	58	9	5
4.....	53	9	.....	21.....	60	6	4
5.....	54	7	.....	22.....	78	11	4
6.....	69	4	.....	23.....	67	7	4
7.....	58	10	.....	24.....	56	7	.....
8.....	61	4	.....	25.....	60	4	1
9.....	48	9	.....	26.....	91	7	4
10.....	73	12	1	27.....	57	11	3
11.....	100	8	3	28.....	71	8	4
12.....	58	8	2	29.....	69	7	1
13.....	48	9	4	30.....	38	6	.....
14.....	52	7	3	31.....	75	9	.....
15.....	46	8	3				
16.....	68	10	6	Total ..	1,998	245	66
17.....	66	7	3				

Whole number of animals driven, 1,998; number taken, 245, *or 89 per cent rejected.* Last drive from this place, June 28, *when 85 per cent were rejected.* Everything taken over a 5-pound skin and under the "wigged" 4 and 5 year old pelts. Ninety per cent of the seals rejected to-day were yearlings.

This is the largest number yet driven in any one drive from this place thus far this season, and the catch among the smallest. The yearlings driven before, plus the new arrivals, are making the ratio.

Not a seal on the hauling grounds and sands of Lukannon Bay, and none on Ketavie; about 500 yearlings at Middle Hill, and none of that pod near the sand beach at Tolstoi rookery that I saw yesterday afternoon. They have evidently made for Middle Hill.

July 2, 1890.—The following are field notes of the podding and clubbing of a drive made from every section of Polavina and Stony Point:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	83	7	.....	16	55	5	2
2	91	11	.....	17	104	8	2
3	101	6	4	18	113	12	5
4	59	4	.....	19	73	15	.....
5	50	6	.....	20	62	11	3
6	56	6	2	21	91	13	5
7	63	5	3	22	63	8	7
8	65	10	.....	23	49	6	2
9	102	4	.....	24	47	9	7
10	90	6	5	25	40	6	5
11	100	12	7	26	43	11	4
12	71	13	2	27	51	9	6
13	72	14	3				
14	65	8	2	Total	1,929	230	80
15	60	5	3				

Whole number of animals driven, 1,929; number taken, 230, *or 88½ per cent rejected.* There were also 10 "road" and "smothered" skins, which made a total of 240 taken. Last drive from this place, June 25, when 800 animals were driven and 263 taken, *or 65 per cent rejected.*

This drive to-day covers a whole week's interval since the last drive from Polavina, and it shows that as the season advances, *the numbers driven rapidly increase, while the proportionate catch diminishes.* In other words, the new arrivals, plus those redriven, will continue to steadily swell the gross aggregate driven day by day from now on, and not proportionately increase the catch. Rather, I believe that the catch will markedly diminish.

To-day, every good 2-year-old, every 3 and every "smooth" 4 year old was knocked down out of this 1,929 animals: every one! Where, at this rate of killing, is the new blood left for the rookeries now so desperately needed there? Hardly a young bull left, between the effects of driving and the deadly club, save a few hundred of those demoralized and worthless half bulls, which I make note of as they come up in every drive; and these, the natives truly declare, will never go upon the rookeries.

Thus far, this season, every seal that is eligible in weight, from a "long" 2-year-old male up to 5-year-olds, has been ruthlessly slain within a few days after its appearance on these desolate hauling grounds of St. Paul Island. They were as ruthlessly knocked down last year; and to-day, the yearlings and everything above to 5-year-olds, *would be knocked down, did not the new $10.22 tax per skin save their lives!* The new deal, in this respect, was lucky for the seals.

My assistant, Palmer, came in from Northeast Point this afternoon. He tallied a killing there, yesterday, as follows: Counting the seals one by one as they shamble out from the pod when released, and then the ones knocked down, adding the two counts gives the whole number in the pod.

The following are field notes of the podding and clubbing of a drive made at Northeast Point (Fowler's party), July 1, 1890, taking nothing under a 6-pound skin, or "long" 2-year-olds.[1]

Pod.	Number driven.	Number taken.	Pod.	Number driven.	Number taken.
1.....	62	8	15.....	36	10
2.....	53	1	16.....	35	6
3.....	56	4	17.....	28	1
4.....	35	1	18.....	42	4
5.....	44	6	19.....	29	6
6.....	62	4	20.....	39	5
7.....	46	6	21.....	30	2
8.....	52	7	22.....	38	5
9.....	47	8	23.....	31	3
10.....	42	3	24.....	26	5
11.....	66	3	25.....	22	4
12.....	58	9			
13.....	62	5	Total..	1,103	120
14.....	59	4			

Whole number of animals driven, 1,103; number taken, 120, *or 91½ per cent rejected.*

July 3, 1890.—The following are field notes of the podding and clubbing of a drive made from every section of Upper and Lower Zapadnie, July 3, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	99	16	5	9.....	63	17	9
2.....	70	11	2	10.....	70	8	8
3.....	71	10	3	11.....	62	17	5
4.....	63	9	.....	12.....	46	18	.....
5.....	50	16	5	13.....	71	12	5
6.....	78	18	4	14.....	62	18	4
7.....	61	6	8				
8.....	59	11	6	Total..	925	180	54

Whole number of animals driven, 925; number taken, 180, *or 81 per cent rejected.* Nothing under a 6-pound skin taken, or "long" 2-year-olds. Last drive from this place, June 26, 1890, when 344 animals were driven and 97 taken, *or 72 per cent rejected.*

These drives at Zapadnie are made just as they are at all the other rookeries this season—made from the immediate outskirts of the breeding animals, cows, pups, and bulls. This method of driving was not even suggested, much less done, in 1872–1874. *Such a proceeding would have been voted abominable then; it is still more so now—it sweeps every young male seal that is 4, 3, and 2 years old into death as soon as it hauls on these shores to-day.* Nothing escapes except that which maturing age or extreme youth saves, or rather which the high tax of 1890 ($10.22) saves.

The only spot on this island where seals have hauled outside of their close and immediate juxtaposition with the breeding classes, is on Middle Hill sand beach, at a point on the English Bay sea margin about halfway between Neahrpahskie Kammen and Tolstoi rookery.

I can not summon language adequate to express my condemnation of the present method of driving. Careful as it is, it is a method made necessary by the amazing scarcity of young male seals. *Under any and all circumstances there should be a stated and positive reservation of half the hauling grounds on these islands as a place of undisturbed rest and*

[1] Half bulls not tallied.

refuge for these young male seals and yearlings—places where material can and would grow up in full vigor to supply the imperative demands of nature on these breeding grounds. These reserves would, in fact, be reservoirs that would be a steady source from which this stream of particular seal life can regularly flow, without diminution in its volume, from year to year.

This method of driving in 1890, huddles and hustles the breeding lines, and sweeps the few surplus bulls that may be outside, up and away to the killing grounds—stampeded into the drive.

July 4, 1890.—To-day, finding that the supply of 3 and 4 year olds and "long" 2-year-olds was practically exhausted—in other words, that more and more seals were being driven up every day, and less and less skins taken—the company's agent dropped his standard to 5½-pound skins. This takes in all the average 2-year-olds, which have hitherto been rejected as they appeared in the pods. But even this tumble to a lower grade did not prevent a small catch, as the following tabulation of the biggest drive of the season as to numbers testifies.

The following are field notes of the podding and clubbing of drive made from English Bay, Middle Hill, and Tolstoi, July 4, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	84	4	.....	33	45	6	.....
2	81	6	1	34	47	8	.....
3	90	3	2	35	61	10	.....
4	94	8	.....	36	61	4	.....
5	65	8	.....	37	52	.....	1
6	75	8	1	38	36	3	.....
7	52	5	3	39	40	6	2
8	61	7	3	40	49	5	6
9	76	8	3	41	52	6	.....
10	70	11	4	42	67	5	1
11	126	14	1	43	64	4	4
12	82	15	1	44	58	3	1
13	71	13	1	45	59	9	.....
14	81	11	.....	46	68	10	1
15	92	10	3	47	58	8	.....
16	63	9	.....	48	56	2	.....
17	76	11	3	49	70	6	.....
18	69	7	.....	50	45	2	.....
19	68	9	1	51	58	4	.....
20	58	7	1	52	64	8	.....
21	74	9	2	53	38	3	.....
22	56	6	3	54	36	2	.....
23	53	4	2	55	66	8	.....
24	92	10	4	56	62	8	.....
26	72	7	3	57	53	5	.....
25	46	10	1	58	53	5	.....
27	70	4	.....	59	56	14	.....
28	85	10	1	60	40	8	.....
29	77	12	.....	61	41	7	.....
30	69	4	.....	62	42	5	.....
31	97	8	.....				
32	111	12	1	Total	4,323	432	67

Whole number of animals driven, 4,323; number taken, 432, *or 90½ per cent rejected.* Last drive from this place, June 30, when 1,262 animals were driven and 203 taken, *or 84½ per cent rejected.*

July 5, 1890.—Visited Otter Island. No seals whatever hauled out there save a small squad of 50 right on the rocks awash, above our landing; has been none thus far this season, or no sign of them. Last year some 1,500 or 2,000 were hauled out here at this date. Grass has thickly and solidly grown over the hauling grounds, clear down to the surf, all over those places which were polished bare of every trace of vegetation by the hauling seals in 1872–1874.

July 7, 1890.—The following are field notes of the podding and club-

bing of a drive made from English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	70	7	1	31	74	8	.....
2	52	11	.....	32	59	4	.....
3	41	7	1	33	73	5	.....
4	79	9	6	34	62	10	.....
5	77	17	1	35	79	15	.....
6	66	8	1	36	74	8	.....
7	60	10	1	37	56	5	1
8	48	7	2	38	70	4	1
9	70	11	3	39	77	5	2
10	38	4	.....	40	43	9	.....
11	89	9	2	41	59	7	.....
12	101	4	.....	42	59	5	.....
13	64	2	.....	43	41	2	.....
14	42	2	.....	44	56	.....	.....
15	121	12	.....	45	84	15	.....
16	102	5	3	46	50	5	.....
17	76	6	.....	47	60	3	.....
18	70	5	.....	48	38	5	.....
19	78	8	.....	49	53	6	2
20	86	11	.....	50	45	6	.....
21	70	4	2	51	43	4	.....
22	82	2	.....	52	45	8	.....
23	72	5	.....	53	40	4	.....
24	75	3	.....	54	47	3	.....
25	62	5	3	55	70	1	.....
26	100	7	3	56	42	2	.....
27	61	7	3	57	66	7	.....
28	59	4	.....				
29	110	5	.....	Total	4,001	350	42
30	65	7	3				

Whole number of animals driven, 4,001; number taken, 350, *or 92 per cent turned out.* Last drive from this place, July 4, when 4,323 animals were driven and 432 taken, *or 90½ per cent turned out.* To-day every 2-year-old down to middle or medium, or every 5½-pound skin, was taken. *Had the standard been kept at original mark the rejection would have been as high as 95 to 96 per cent!*

July 8, 1890.—Yesterday afternoon I went back to Tolstoi over the seal road on which the drive above tallied was made in the night and morning of the 7th instant. The number of road "faints" or skins was not large, which shows that the natives had taken great care in driving. This they have uniformly done thus far: but, when they pick up the drives at Zapadnie, at Lukannon, on the Reef, and at Polavina, they are obliged, in order to get all of the holluschickie, to sweep the very skirts of the rookeries. That is wrong; it should not be permitted. When matters become so desperate as to obligate such a method it is time to call a halt.

I went up to Stony Point this morning early, and made the following field notes of the podding and clubbing of a drive from Polavina and all the beach below to Stony Point:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	96	9	.....	15	63	16	2
2	62	5	.....	16	61	4	3
3	60	5	1	17	64	12	8
4	87	9	1	18	56	7	10
5	65	6	.....	19	69	9	4
6	86	5	.....	20	72	14	4
7	73	13	.....	21	62	9	5
8	62	9	.....	22	91	20	6
9	86	9	2	23	78	19	7
10	108	7	2	24	59	8	9
11	80	8	4	25	61	11	3
12	75	7	2	26	43	7	.....
13	98	14	4				
14	58	13	8	Total	1,865	255	85

A drawing from nature by the author.

HOLLUSCHICKIE HAULING ON LUKANNON SANDS, SAINT PAUL ISLAND, JULY 10, 1872.

Scarcely one of these seals seen out here in 1893.

PLATE 44.

Whole number of animals driven, 1,865; number taken, 255, *or 87 per cent turned out.* Last drive for this place, July 2, when 1,929 animals were driven and 210 taken, *or 88 per cent turned out*, but the standard to-day being lowered to 5½-pound skins prevents the increase of rejection percentage. Had the same standard prevailed to-day as on July 2, the rejection would have been as high as 92 per cent!

This drive was principally made from the sand beach under Polavina rookery, and on its outskirts to the north; and that is where these 85 half bulls (really, *nearly all of them were 7 and 10 years old*) were gathered in. The two prior droves were chiefly made from the parade ground up above the breeding ground, and there these bulls were first gathered in. *To-day every 2-year-old was taken that was well grown*, and had not these smaller seals been taken there would not have been over 120 or 150 skins at the most. The first citation, 120, is the nearest correct; this would have given us a rejection of over 93 per cent.

I came down to the village on the sand beach between Stony Point and Lukannon. Not a killable seal has hauled there yet this year, a place where thousands upon tens of thousands of them were to be seen at this time in 1872. Not a holluschak has as yet hauled upon Zoltoi sands. That was one of the finest resorts for holluschickie that the island boasted of in 1872–1874.

July 9, 1890.—I went over to Zapadnie early (4 o'clock) this morning to witness the driving there by the natives. Most of the scanty drive was taken on the immediate borders of Upper Zapadnie rookery. The whole sweep of Lower Zapadnie did not yield over 150 or 200 holluschickie, which had hauled out at several places just up and above the breeding seals.

All that large space above the rookery on Lower Zapadnie, which was literally alive with trooping platoons of holluschickie in 1872, *is to-day, entirely vacant, not a seal on it;* and the natives peering down over the high bluffs on the south side and to the westward of the point trying to find a few seals skulking down there on the rocks awash. Their eager search in such a quarter, with their backs to this silent parade ground of 1872, made me decidedly thoughtful. They said that they would go with a "bidarrah" and pick these secluded seals up. They did so last year, they averred. I made the following field notes of the podding and clubbing of a drive made from Upper and Lower Zapadnie, July 9, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	125	11	.....	10.....	37	6	2
2.....	67	19	2	11.....	47	8	4
3.....	48	9	3	12.....	52	9	1
4.....	54	12	4	13.....	43	15	2
5.....	55	9	4	14.....	34	9	3
6.....	56	17	5	15.....	59	6	.....
7.....	44	7	5	16.....	45	9	2
8.....	47	11	2				
9.....	54	13	3	Total..	867	172	42

Whole number of animals driven, 867; number taken, 172, *or 83 per cent rejected.* Last drive from this place July 3, when 925 animals were driven, and 180 taken, *or 81 per cent turned out.* Lowering the standard on the 4th instant prevented an immense percentage of rejection here to-day. Had it not been for the small 5½-pound skins taken, *there would have been 95 per cent rejection!*

July 10, 1890.—The following are field notes of the podding and clubbing of a drive made from every section of the Reef and Garbotch, July 10, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	86	5	.....	26	56	10	.....
2	67	8	.....	27	57	1	.....
3	62	8	.....	28	52	8	.....
4	74	7	.....	29	106	1	.....
5	85	9	.....	30	101	14	.....
6	76	14	.....	31	70	7	1
7	47	8	.....	32	65	7	2
8	54	7	.....	33	86	7	1
9	87	11	.....	34	68	6	2
10	80	5	.....	35	68	19	1
11	74	13	2	36	59	10	1
12	56	9	1	37	60	10	1
13	48	4	2	38	70	7	2
14	94	4	.....	39	81	7	1
15	76	6	1	40	74	3	1
16	52	4	.....	41	59	15	.....
17	73	10	3	42	64	15	.....
18	74	9	3	43	78	6	.....
19	70	15	2	44	62	5	.....
20	61	12	.....	45	77	3	5
21	104	5	.....	46	57	7	.....
22	62	9	.....	47	52	3	.....
23	58	10	.....	48	41	7	.....
24	69	6	.....				
25	66	3	.....	Total	3,246	377	21

Whole number of animals driven, 3,246; number taken, 377, *or 89 per cent rejected.*

The last drive from this place and killing was made on the 5th instant, and was not tallied by myself. I was over to examine Otter Island while the killing was in progress. Five hundred and twenty-six skins were taken, however, with the standard lowered to 5½-pound skins, and as I looked at the drove in waiting on the killing grounds that morning I estimated that there were at least 4,000 animals in it.

On the 1st of July a drive of some 2,000 animals was made from this place, and with the higher standard, the original standard, 245 skins were taken. That standard applied to-day would have cut the catch of 377 down to less than 200; more likely to 150. *As the clubbing progresses now, every 2-year-old holluschak, from average size up, is taken to the 5-year-olds and "wigged" 4-year-olds.* The "short" 2-year-olds and the yearlings escape. The standard used on the 11th of June, by which nothing under a good 3-year-old skin was taken, if followed to-day, through the podding and clubbing of the 3,246 driven seals above itemized, *would not have given the lessees more than 80 skins!*

July 12, 1890.—The following are field notes of the podding and clubbing of a drive made from English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie, July 12, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	98	7	.....	39	68	9	.....
2	65	.....	.....	40	50	11	1
3	78	8	2	42	54	6	.....
4	64	5	.....	42	76	4	.....
5	52	8	.....	43	65	6	.....
6	64	2	2	44	87	6	.....
7	63	6	1	45	64	13	.....
8	73	10	4	46	87	14	.....
9	59	9	.....	47	77	18	.....
10	78	10	.....	48	76	16	.....
11	63	2	.....	49	71	8	.....
12	69	9	.....	50	71	11	.....
13	51	6	1	51	91	11	.....
14	46	7	.....	52	88	13	.....
15	62	9	.....	53	89	13	.....
16	49	6	.....	54	86	5	.....
17	58	6	2	55	89	9	2
18	63	6	3	56	100	10	1
19	59	9	1	57	92	13	.....
20	77	10	2	58	72	8	.....
21	40	7	.....	59	87	10	.....
22	49	10	1	60	76	7	.....
23	50	13	.....	61	93	10	1
24	52	8	.....	62	114	16	2
25	26	2	.....	63	48	6	2
26	53	10	.....	64	81	6	.....
27	67	9	.....	65	71	15	.....
28	50	16	.....	66	79	10	.....
29	51	5	.....	67	69	10	.....
30	65	8	.....	68	91	12	.....
31	60	4	1	69	60	6	.....
32	61	4	.....	70	66	12	.....
33	44	3	.....	71	60	13	3
34	56	8	1	72	47	4	2
35	79	5	5	73	55	5	3
36	26	1	1	74	101	13	.....
37	58	6	2				
38	58	11	2	Total	5,150	633	48

Whole number of animals driven, 5,150; number taken, 633, *or 89½ per cent turned out.* Last drive, July 7, from this place, when 4,001 animals were driven, and 350 taken, *or 92 per cent turned out.*

This is the second drive from these places, ranking largest in number, but it has rested since July 7, or five days, a day longer than has been given yet to it this season; and then the natives purposely left a squad of at least 300 yearlings in the lakes at the head of the lagoon and another squad of at least 250, under the Lukannon sand dunes.

When it is borne in mind that in the very height of the season, after five days' rest or nonattention, only 633 medium fur-seal skins, mostly 5½-pound clean skins or 2-year-olds, can be secured from the combined scraping of everything in English Bay (on Zapadnie and Southwest Point we know there is nothing), Middle Hill, Tolstoi, Lukannon, and Ketavie, the extraordinary condition of these interests can be well understood in a general way. *Such a driving in 1872 at this time* and circumstances of weather would have brought *at least 50,000 holluschickie up here, instead of the 5,150 to-day!* There were a number of cows in this drive; I counted three that I was sure of.

Sunday, July, 13, 1890.—Walked up to Northeast Point early this morning for the purpose of plotting the area and position of the breeding seals on the Polavina and Novastoshnah; also to see the natives drive at Polavina. I was on the ground at 5 a. m. and saw the whole *modus operandi.* The holluschickie haul up close against the sand

beach "drop" of Big Polavina rookery, and the drivers, in getting the young males, swept four cows into the drove, and their little black pups were left behind them on the sand, bruised and marked by the stampeding flippers of the herd. To get the holluschickie, they are obliged to drive in this violent manner.

Another squad of, say, 1,000, mostly young or "short" 2-year-olds and yearlings, was swept up on the parade plateau, and another squad was driven from Little Polavina parade, the first drive that has been made from there thus far this season. No seals in this division but small ones. I have charted these areas of hauling.

Along the entire spread of Lukannon, Polavina, and Northeast Point sand beach, 8 miles nearly, *I did not see a single young seal—not one hauled out;* only a dozen or two old worthless bulls scattered here and there over this extent at wide intervals. *At this time in 1872 such a walk as mine this morning would have brought me in contact with and in sight of from 50,000 to 100,000 holluschickie!* The weather, too, is simply superb sealing weather—all day yesterday, last night, and this morning.

About 300 yards north of that basaltic shoulder which terminates the sand beach above Little Polavina rookery, and fully a mile from it, I saw on the sand beach this morning, a single cow guarded by two old bulls. This is the first example of solitary hauling of a female (it was an old cow) that I have ever witnessed. It is a straw, however, showing the way the wind is blowing up here this season—points to the demoralization which the present order of affairs is working, and which has been pretty steadily at work ever since 1882.

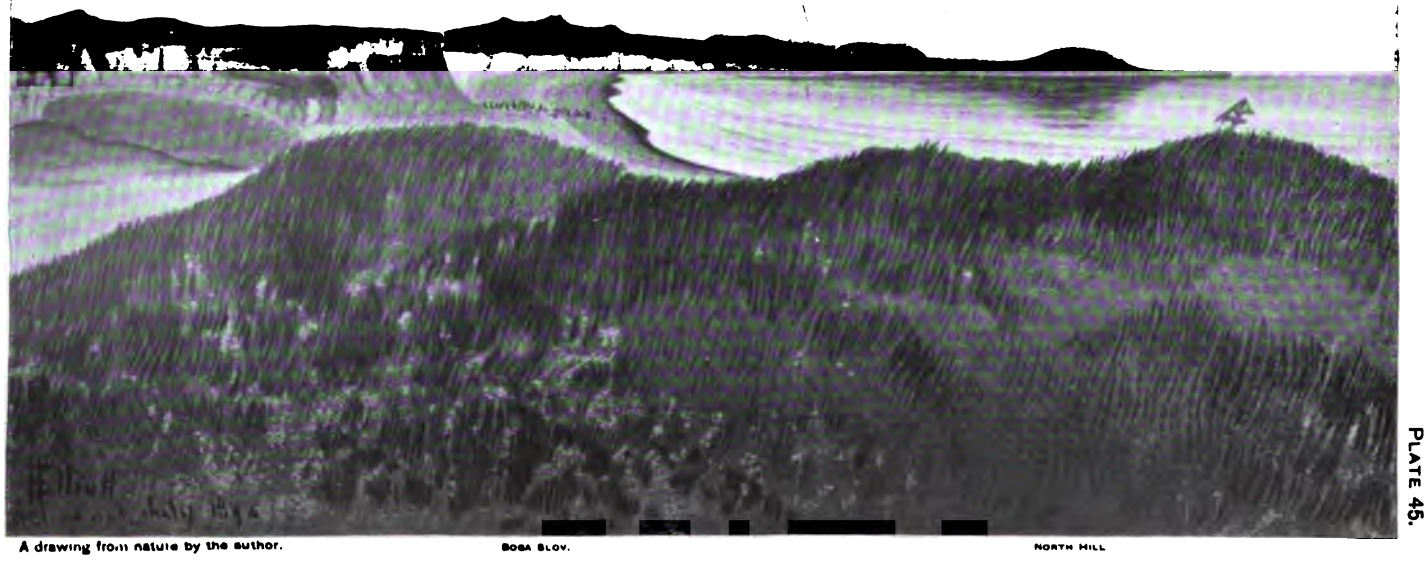
Found Fowler busy on the killing grounds just across the lake from Webster's house, where I arrived at 7.30 a. m. Mr. Goff joined me soon after, and we at once take up the rookery survey.

Fowler this morning had over 5,000 seals in his drive, but took only 473 of them. In the afternoon, the rain coming up, he made a rapid drive of those holluschickie which he had been saving for to-morrow, fearing that the rain would send them to the sea, and thereby secured 168 more, making a total of 641, being the highest limit reached in any one day's killing up here this year. On this day last year, Webster killed 1,883 and the next day 1,156; but, Fowler will have no holluschickie to kill to-morrow.

The driving up here has radically changed since 1872. Then Webster got all the killable seals he wanted from that sand beach on the neck between the foot of Cross Hill on the north shore and the Big Lake sand dunes. He never went out along the outskirts of the rookery; it was not even thought of.

The hauling now at Novastoshnah takes place at seven intervals or breaks in the breeding belt, and right in the rear and fairly among the scattered harems in many instances. We saw the scraping tracks of the drive which had been made in the early hours of this morning. We found 15 or 20 pups which had been swept away by the drive, out into the rear, killed or dying by the stampede incident to such driving, just as I witnessed it at Polavina this morning, on my way up.

The parade fields of this once magnificent breeding ground are positively vacant to-day; grass and white close-bunched flowers are growing and springing up everywhere all over them, while large areas of the well-polished ground of 1872–1874 are sodded over. The holluschickie as they hauled to-day did not occupy a space of ground 500 by 50 feet in depth over the entire extent of this immense habitat of theirs: and the drive of 5,000, which we saw on the killing grounds, had been



A drawing from nature by the author. BOSA BLOV. NORTH HILL

THE NORTH SHORE OF SAINT PAUL ISLAND, JULY 13, 1890.

View from Sand Dunes, north of and right under Cross Hill, showing the long expanse of abandoned hauling grounds on the sands of the north shore, upon which Webster got his catches of 1873-1874, exclusively; no seals out there in 1890, save the small squad indicated.

PLATE 45.

scraped from seven different points between the base of Hutchinson Hill and the southeast extremity of the rookery.

On the northwest shoulder a small pod of say 400 holluschickie were lying in just back of the narrow strip of rookery there, about 250 feet back from the sea. A little way over, across to the south, was another small pod of less than 300, near the small sand beach between the middle and the northwest shoulders. Then another small pod appeared just below the south shoulder, lying above surf wash on the sand, and another small squad lay out on that once famous reach of sand beach under Cross Hill and the Big Lake sand dunes. All told, there could not have been over 3,500 of them. These, plus the 5,000 which Fowler had in hand, gives us all there is on this great rookery to-day—8,500 holluschickie; 95 per cent of them yearlings!

This hauling in under the cover of the breeding seals by the non-breeding young males, as we see it to-day, recalls forcibly the account which the natives gave to Lieutenant Maynard and myself about the holluschickie as they hauled in in 1835 and several years thereafter. They then "lay in among the breeding seals."

In 1872, instead of these frequent breaks that now appear in the circuit of this rookery belt here, only one place then existed from Sea Lion Neck clear around to the end of the southwest shoulder. The holluschickie were then literally obliged to haul out over that sand beach opening in Sea Lion Bight, where there was an open reach of several hundred feet of sea margin, which was avoided by the breeding seals on account of the sand. To-day, there are twenty-five or thirty vacant spaces in the breeding belt of the Novastoshnah, all open for the holluschickie.

July 14, 1890.—The following are field notes of the podding and clubbing of a drive made from every section of the Reef peninsula, July 14, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	117	4	3	13	69	4	.....
2	51	4	.....	14	69	3	.....
3	80	1	.....	15	63	9	.....
4	73	5	.....	16	60	7	.....
5	68	7	.....	17	61	6	.....
6	77	11	.....	18	47	3	.....
7	69	11	2	19	61	2	1
8	70	5	2	20	38	4	.....
9	69	4	1	21	74	2	.....
10	73	2	1				
11	82	4	.....	Total	1,592	101	10
12	71	3	.....				

Whole number of animals driven, 1,592; number taken, 101, *or 93 per cent rejected.* Last drive, July 10, when 3,246 animals were driven and 377 taken, *or 89 per cent rejected. This drive shows the elimination of the 2-year-olds, which were first taken here on the 5th instant—now, nearly all yearlings!*

July 15, 1890.—The following are field notes of the podding and clubbing of a drive made from English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie, July 15, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1	82	5	4	31	104	8	2
2	90	7	9	32	102	8	.....
3	89	4	.....	33	76	10	.....
4	77	3	1	34	85	6	1
5	69	6	1	35	88	5	2
6	80	3	.....	36	77	5	3
7	66	1	.....	37	102	5	1
8	77	2	.....	38	84	4	.....
9	83	8	.....	39	74	8	1
10	70	2	.....	40	76	6	1
11	79	6	.....	41	120	11	.....
12	76	2	.....	42	91	6	.....
13	57	3	.....	43	76	8	.....
14	55	3	.....	44	84	7	1
15	84	5	.....	45	78	7	.....
16	80	4	.....	46	81	.....	.....
17	66	4	.....	47	80	3	.....
18	80	1	.....	48	84	5	.....
19	78	5	.....	49	119	7	.....
20	79	4	2	50	94	7	.....
21	68	4	2	51	83	7	.....
22	89	3	.....	52	65	3	.....
23	53	2	.....	53	68	8	3
24	98	5	.....	54	91	6	.....
25	90	8	4	55	90	7	.....
26	76	4	2	56	85	6	.....
27	80	9	.....	57	89	13	.....
28	109	5	1				
29	93	6	5	Total	4,644	309	47
30	117	8	1				

Whole number of animals driven, 4,644; number taken, 309, *or 93 per cent rejected.* Last drive from these places, July 12, when 5,150 animals were driven and 633 taken, *or 89 per cent rejected. Nearly all yearlings in this drive—the dregs are now being drawn upon!*

In this drive, I do not think there were 60 skins taken that were 3-year-olds, or 7-pound skins, and certainly not 20 4-year-olds. Of course every one of them was instantly clubbed, as they have regularly been the moment they appeared in the pods since the season opened. *No 2-year-old of normal growth escaped to-day; only the yearlings, the "runty" or "short" 2-year-olds and few half bulls,* which I have numbered. These half bulls in all my tallies are those that run all the way up from 5-year-olds to advanced age, 10 or 15 years.

The evidence of redriving was stronger than ever to-day; *the number of "moon-eyes" being so large that every pod exhibited one or more examples.* Fully half of the animals in this drive have been up here over and over again this season. In my opinion, as I have been watching the course of these released seals, I believe that some go back at once on the day of their release to the hauling grounds. Not all return to the same place from whence driven that day, but haul out on other grounds here, there, and anywhere else on the island. They are then soon again picked up in the rapid rotation of driving, and put through this painful land journey again and again in this manner. The others go out to sea in quest of food, and perhaps are gone a week, to return and land as above cited, and then be again driven and redriven. Thus it becomes an exceedingly difficult matter or problem to solve, i. e., the query of how many of these seals that appear in this drive to-day, 4,644, are up here for the first time? How many of them have hitherto been driven from the seven or ten different hauling spots on this island this season? And how often have they been thus redriven?

Ever since the 10th and 12th instant the yearlings, i. e., last year's pups, have been hauling in greatly increased numbers daily, and will do so until the 20th instant. This was their habit in 1872–1874, and I notice by these tallies on the ground that it is their habit to-day. Of course the $10.22 tax paid this year rules them out safely from the club, otherwise they would have been slaughtered. This shift from the $3.17 tax of 1870, to the $10.22 tax of 1890, is an exceedingly fortunate one for the seals, and the Government. It has prevented what would have been close to the finishing touch relative to the destruction of these rookeries; yes, perhaps such a killing which would have made it the labor of fifteen years to restore them and the hauling grounds dependent, to their standard of 1872. As it now appears, it will require at least seven years of absolute rest, killing nothing here during that time save that small numbers of pups and yearlings required annually for the food and clothing of the natives of the Pribilov Islands. Had there been no killing at all this year, it even then would have required a rest of at least five years, beginning with this season. The work of last year, and this, was and is literally "robbing the cradle and the grave."

July 17, 1890.—The following are field notes of the podding and clubbing of a drive made from Polavina July 17, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Four-year wigs.	Pod.	Number driven.	Number taken.	Half bulls.	Four-year wigs.
1.....	96	9	6	.....	10.....	158	18	20	8
2.....	84	15	6	9	11.....	76	6	14	4
3.....	81	11	5	.....	12.....	73	15	26	7
4.....	124	9	6	.....	13.....	61	18	17	8
5.....	134	9	13	10	14.....	70	3	.....	1
6.....	101	7	8	7	15.....	41	5	7	1
7.....	114	16	10	6	16.....	67	7	9	3
8.....	124	14	14	12					
9.....	130	10	17	5	Total..	1,514	172	168	81

Whole number of animals driven, 1,514; number taken, 172, *or 87 per cent turned out.*

Of the 172 taken as above, 81 were 4-year-old "wigs." This is the first killing of this low-grade skin made thus far this season; they have been driven up steadily and redriven, and as steadily rejected. *Had they not been taken to-day the percentage of rejection would have been 95!*

The following are field notes of the podding and clubbing of a drive made from Lukannon and Ketavie July 17, 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Pod.	Number driven.	Number taken.	Half bulls.
1.....	150	18	6	10.....	70	12	11
2.....	137	26	3	11.....	66	11	10
3.....	91	14	5	12.....	72	12	7
4.....	62	12	5	13.....	65	5	2
5.....	80	18	7	14.....	67	5	7
6.....	73	12	6	15.....	63	7	1
7.....	83	14	3	16.....	74	10	.....
8.....	80	12	4				
9.....	80	9	5	Total..	1,320	197	83

Whole number of animals driven, 1,320; number taken, 197, *or 85¼ per cent rejected.*

A small squad of 3 and 4 year olds hitherto undriven, though marked on Ketavie during the last three days, some 80 or 90 all told, were

secured in this day's drive, being brought right up through the scattered breeding animals from the point of Ketavie. This raises the catch proportionately in the little drive. The Lukannon seals were nearly all yearlings, and only 7 "wigged" 4-year-olds were knocked down in this batch; at least 25 or 30 of them were released.

Thus these two small drives for this day show an irregularity in their percentage, both being due to exceptional incidents. The Polavina catch of 172 would not have touched 100 skins had it not been for the sudden drop to "wigged" 4-year-old bulls, 81 of which were knocked down. It is the very first systematic killing of this class made thus far this season. It is, however, a small matter—drive, catch, and all.

The Ketavie drive was principally made from the extreme point, a new spot which has not been driven from before, but the rookery is now so thin and straggling that the drivers were able to get fairly down onto the point and dislodge about 100 good 3 and 4 year olds. The balance of the 197 skins taken in this united drive with Lukannon are small 5½ to 6 pound skins.

Going up to Polavina early this morning, I did not see a single young male seal on that long reach of sand beach between Lukannon and Polavina; only weak, sickly, or dying seecatchie, a dozen or two of them, and nothing else. The utter absence of the holluschickie from these sands of Lukannon beach and those extensive hauling grounds back of them on the Volcanic ridge and half a mile again to the northward—this desolation is fully as startling a contrast with their life and animation in 1872 as is that of Zoltoi sands and English Bay.

July 18, 1890.—The following are field notes of the podding and clubbing of a drive made from Zapadnie, the last drive here for 1890:

Pod.	Number driven.	Number taken.	Half bulls.	Four-year wigs.	Pod.	Number driven.	Number taken.	Half bulls.	Four-year wigs.
1.....	94	13	5	6	11.....	89	15	4	6
2.....	50	11	11	3	12.....	51	12	9	3
3.....	76	17	9	5	13.....	61	20	9	7
4.....	78	15	5	4	14.....	63	15	6	6
5.....	82	12	2	3	15.....	72	22	7	8
6.....	85	15	.....	3	16.....	46	11	16	5
7.....	81	12	5	.....	17.....	69	16	9	5
8.....	71	11	8	4					
9.....	72	8	8	1	Total..	1,192	241	115	74
10.....	72	15	2	5					

Whole number animals driven 1,192; number taken, 241, *or 79 per cent rejected.* Minus the "wigged" 4-year-olds, 88 per cent turned out.

This tally of the final killing of the season at the Southwest Bay killing ground of Zapadnie shows that extraordinary scarcity of holluschickie in a most lucid manner when contrasted with the other drives of this year, which I have tallied on this once-famous rendezvous. This last scrape made here to-day was opened by the appearance of only 1,192 animals on the grounds after a rest of nine days since the last drive; *115 of these 1,192 seals were old bulls, all over 6 years, and most of them 7 and 10 year olds,* and all the balance, outside of the 241 animals knocked down, were yearlings, chiefly, a few "runty" 2-year-olds, a few bitten 4-year-old "wigs," and a few 5-year-olds. *Every 4-year-old "wig" was taken, as at Polavina yesterday, for the first time this season.* Every "smooth" 4-year-old was taken in the first drives and now, the dregs are drawn also!

These young bulls vary remarkably in this matter of being with

PLATE 46.

A drawing from nature by the author.

A STROLL ON LUKANNON BEACH, SAINT PAUL ISLAND, JULY 13, 1872.

Every rod of these long sand beaches between Lukannon and Polavina, and Polavina and Northeast Point, in 1872–1874, was covered with bachelor seal bands, "hauling in" and "hauling out" day and night during the breeding season, together with a large number of old bulls which had been whipped off from the rookeries by their rivals; sulky and morose, they slowly and reluctantly got out of the pedestrian's path.

manes, or "wigged," or not, at the culmination of their fourth year of growth, just as young men at 18 vary as to having moustaches or beard or not. The "smooth" or unwigged 4-year-old is a fine skin, but the "wigged" 4-year-old is a poor one.

Thus far this season until yesterday morning, I observed that from the beginning, though every "smooth" 4-year-old was clubbed, yet every "wigged" one of that age and upward was never taken unless struck down by accident.

I have seen once in a while a 3-year-old so wigged as to be a really poor skin; but that is a rare example when found of this age, and, for that matter, the "wigged" 4-year-olds do not number one-tenth of their class as they grow up.

July 19, 1890, 4.30 a. m.—As I go over to the *Rush* at the East Landing I observe that not a single young male seal is on Zoltoi sands this morning—not one has hauled there thus far this season.

I leave for St. George Island on the *Rush* at 5 a. m., arrive there at 11 a. m.

FIELD NOTES ON ST. GEORGE ISLAND.

July 19, 1890.—I made a careful survey of the North rookery this afternoon and its hauling grounds. The perfect desolation, the grass growing, flowers blooming over the polished hauling grounds of 1873–74 are as much, or even more marked here, if possible, than on St. Paul. The natives, ever since this season of 1890 opened, have been scraping the rookeries, and, up to this morning, had taken but 2,964 skins, ruled by the standard of nothing under a 7-pound pelt (which was started as the rule on St. Paul but dropped day after day down to 5-pound skins this morning). These St. George natives were *unable to get out of every 1,000 animals driven up more than 50 to 60 such 7 and 12 pound skins* as the rule of killing called for. The order was given to-day for Webster to take everything down to 5 pounds in the drive then awaiting, and he did so for the first time this year, getting about 640 this evening out of the herd, some 2,500 or 3,000 animals all told. The only seals escaping were the yearlings and old bulls. Every "wigged" 4-year-old knocked down, and several yearlings, by accident, in shaving so fine down to 5-pound skins.

July 20, 1890.—I examined this morning, one by one, the skins that were taken from the drive of yesterday. Three-fourths of them will not weigh more than 5½ pounds, or belonging to the small grade which was ordered not taken until yesterday. Had this standard not been lowered to these small skins not over 150 would have been secured; as it was, 641 were taken.

At Zapadnie, where I went this morning, I observed another drive, which has been saved up for a week. Five hundred and twenty-one skins were taken, as per the above standard. Had the standard not been thus lowered not over 60 or 75 skins could have been taken from this drive. Mr. Webster freely admitted to me, in the presence of Captain Lavender and his son, that he had taken these small skins yesterday, and to-day, for the first time this year. Had he taken them in June and early in July, he would have nothing to-day, on this field but yearlings and half bulls.

The hauling grounds at Zapadnie are simply grass-grown; those at Starry Arteel, the same. The Great Eastern parade is a mere suggestion, and Little Eastern has not had a single drive made from its faint reminder of a once good resort for holluschickie.

In the wake of this drive to-day I saw a number of pups which had

been swept along in the driven herd—their mothers gone in it—they left to perish behind. The podding of these pups way back by the 20th of July on to the abandoned hauling grounds, so that the holluschickie can and do mix with them and their mothers, makes the act of driving from this hour forth, during the remainder of the season simply ruinous to the rookeries; since, bad as it is to-day, it would become worse and worse as it progressed every day after.

July 22, 1890.—These hauling grounds of St. George, which were never by nature of the land and life thereon, as broad and extended as those of St. Paul, were in 1873, polished very brightly by the holluschickie; but that same utter desolation which prevails over them at St. Paul also prevails here. The driving, however, thanks to the good sense of Webster, has not been so excessive as it would have been had a less experienced sealer been in charge. For instance, driving every day from a given hauling ground this season will not yield at the end of a week's work any more seals than it would were the drive made but once in all that time. In 1872–1874, however, so many seals were on hand at every place, that it was necessary to take no more each day than the working force of skinners at the village could handle. But when the seals are scarce, as they are everywhere this year, it is folly to rake and scrape the ragged edges of these breeding rookeries every day or two for a mere handful of holluschickie which can be secured just as well if driven all up once a week. It is the driving, as well as the clubs, that kills.

The method of driving as now ordered, makes the selection of holluschickie, after the pups begin to pod in bulk on or before the 20th of July every season, utterly impossible without sweeping cows into the drive, and dragging their young out to die in the track of this drive. Every day on from this 20th of July, makes the work of such driving worse and worse for the rookeries; so much so that no driving under any and all circumstances after that date ever should have been permitted or will be permitted again if our Government means to preserve and perpetuate these fur-bearing interests on the Priblov Islands.

Bad as driving in effect on the holluschickie is, the driving of cows is certain injury to them; they are fuller in habit and less muscular; their milk glands become inflamed and swollen, and the result must ensue of "garget" or "milk sickness," so well known in cats, dogs, and cattle. That means death or permanent disability, even if the cows are driven but once—death to both cow and her pup left behind, since that pup will not be permitted to suckle any other.

The scraping or sweeping of these rookeries on St. George did not fairly begin until 1884; while it was not really begun in earnest on St. Paul until 1886 or 1887; but the driving here has been lighter than it would have been had I not changed the quota from 25,000 to 10,000 in 1874. In 1887 the difficulty of getting even 15,000 7-pound skins before the end of July, was evident, far more difficult than that of securing 25,000 before the 20th of July in 1872; yet, in spite of this marked deviation from the working record of the preceding seasons, the Treasury agents of 1886–87, in charge of these interests, actually sent in a report to the Treasury Department criticising my figures of 1873–74 and declaring that there were eight times as many fur seals on the St. George rookeries then, as when I made my surveys in 1873–74!

I can not see any difference in the character of the holluschickie here on St. George from those I have studied all summer on St. Paul; indeed, I know that these animals haul on either island indifferently, as they go and come throughout the season. They will haul out here to-day;

and next week, just as likely as not, many of them will be over on St. Paul hauled out there for a spell in turn.

One of the queerest ideas of how to help the holluschickie to haul (when there were none to haul) was a desperate notion of the lessees' agent here last summer, who, on the 9th of June, actually went down into the ragged sea margin at the Near or North rookery, and drove away a few old bulls which had hauled into an empty path of the holluschickie which leads up by the "Raichka." This was done to help the holluschickie "to land faster!"

July 25, 1890.—Weighed 100 skins as they came over from Zapadnie to-day, from the little salt house there, and which were taken on the last day of killing, the 20th instant. Three-fifths of the whole number weighed were 5½ to 6 pound skins—average to "long" 2-year-olds; the balance, 7 to 7½ pound skins, four 8-pound skins, and one 9¼-pound skin, and one 4-pound skin (or yearling).

July 26, 1890.—Weighed 176 skins of the Zapadnie catch of the 20th instant, just as they came over on the burro train. As I handled the skins they ran thus:

Skins.	Weight.	Total.
	Pounds.	*Pounds.*
64	5½	352
26	5	130
4	4	16
42	6	252
20	6½	130
12	7	84
4	7½	30
2	8	16
1	8½	8½
1	9	9
176	.....	1,027½

making the average as low as 5⅞ pounds per skin. This is the run of the last killing on St. George on the 19th and 20th instant. Had the standard first ordered been adhered to, only 20 skins would have been taken instead of 176 in the above catch.

July 30, 1890.—A stiff southwest wind ever since yesterday, has kicked up such a rough sea that to-day, by noon, nearly every seal by the island has hauled out on shore, and it is a good afternoon to inspect the rookeries in so far as my search for pups of last year or yearlings goes.

A careful examination of the largest rookery of this island, North, revealed the presence of about 750 holluschickie—700 at the least, and possibly 900. *All were yearlings*, save a small percentage of 2-year-olds, with scattered examples, wide apart, of 3-year-olds and a dozen perhaps of 4-year-olds.

They were all hauled out (with the exception of one pod of some 150 near the Raichka) and commingled with podding pups and cows. A drive could not be made there to-day of more than 200 holluschickie without driving as many cows and pups.

Such a day as this should show up at least 4,000 yearlings on these spots of that rookery alone. Where are these yearlings?

The pups at the water's edge are beginning to familiarize themselves with their native element, essaying to swim in the pools and surf wash at sheltered spots. Those pups, where the surf directly breaks upon the sea margin and strikes the beach with unbroken force, are not in the water at all to-day. A vast majority of the pups will not get into the water before the end of the next two or three weeks.

I observe a very large proportion of yearling cows scattered all over the breeding ground from end to end near the sea margin, while the yearlings of both sexes are completely mixed up on the outskirts of the rookery here and everywhere else, commingled with the adult cows and their young pups.

August 1, 1890.—Heavy rain has fallen and a stiff southwest gale raged all day yesterday. It cleared up this afternoon. Desiring to see the hauling grounds at Zapadnie and the rookery there immediately after such a storm, where the surf breaks in with full force and fury, I went over and made a survey of the entire field. Since my last visit the pups have podded to the uttermost length and breadth of the place, 1,000 to 1,500 feet back from the surf margin of the rookery, and way up and into the green grass and moss in the rear. Squads of hollus-chickie mingled in with them everywhere, and their mothers, of course; but how many in proportion I can not say, since the yearlings and the 2-year-olds so closely resemble the young cows when all huddled up and startled by the approach of man.

However, if you walk slowly and occasionally sit or stoop down for a few minutes, when an unusual rush by the seals seems pending, you can traverse every one of these breeding grounds without startling or stampeding many of the seals thereon into the water. As these animals, first startled by your unexpected form, cough, spit, snort, and then turn to fly, at that moment you gently squat down. Then they pause, turn curiously to look, and notice that you are not following or moving; then they bolt, altogether, and regard you intently for a minute or two. If you do not move in a few moments more they all resume their occupation of sleeping or playing one with another, as they were doing when you first startled them by your coming.

Then, if you rise slowly to an erect posture and resume your walk very quietly and slowly along parallel with or away from them, they do not seem to pay you any special attention. They will not again start to run or "flip flapper" back into the sea.

August 1, 1890.—Natives drove a pod of 97 seals up for food this morning. Only 5 skins out of the whole number of the 97 seals killed (for they were all killed) were 7-pound pelts, the rest yearlings and 2-year-olds; 85 per cent yearlings.

St. Paul Island, August 9, 1890.—A careful survey of the Reef and Zoltoi, Garbotch, and Gull Hill hauling grounds this morning discloses no change whatever in the lonely character of these places, and I observe the same scarcity of yearlings that has recently impressed me on St. George.

Not a single young male seal on Zoltoi sands this day, and none have hauled there at all this season; and it is safe to say that none will until the pods of swimming pups in October come here from Garbotch. What few hollu-chickie are left here have become so demoralized by the driving early in June, and up to the 20th of July, as to now haul in among the podded cows, where you can easily distinguish them right and left among the "matkahs" and pups. It would be very difficult now to say, as we look out over the field, how many of them are thus hauled out there to-day, but the spectacle is a quiet, sad one to see—that silent parade ground of the Reef, ahead of us. Over its whole smooth sweep a soft, velvety grass and moss is springing up bright and strong under the stimulus of an August air. *That wide expanse is entirely deserted by seals* where in 1872 it was fairly alive with restless trooping thousands and tens of thousands.

That southwest gale of the 30th and 31st of July, which I experienced

and followed so closely on St. George, seems to have destroyed a great many pups over here on the Garbotch sea margin. There are 17 dead pups lying half buried in the sands of Zoltoi right before and under my eyes.

In closing these copies of my field notes on the hauling grounds the following is pertinent. During the killing season several of the elder men, natives on St. Paul, expressed a desire to talk with me about the condition of affairs. I asked them to wait until the work of the season was over, then to come up to the Government house when I returned from St. George, where what they had to say could be heard by all of the Treasury officers as well as myself. The notes below of this interview were made by Mr. Murray. I copy them literally:

VILLAGE OF ST. PAUL, *August 6, 1890.*

In the presence of and hearing of Henry W. Elliott, Charles J. Goff, Joseph Murray, and S. R. Nettleton, United States Treasury agents, the following natives (old men) were called into the Government house by Professor Elliott and examined by Messrs. Elliott, Goff, Murray, and Nettleton, Treasury agents (Simeon Meloviedov, interpreter): Kerick Artamonov, Kerick Booterin, Vasilie Sedoolie, Markeel Vollkov, Eupheem Korchootin, Fedosay Sedick.

Mr. Murray took the following notes of the conversation:

Q. Do you remember Professor Elliott being on this island (St. Paul) in 1872?—A. Yes; we remember him well.

Q. Do you remember that thousands of holluschickie were then hauling at Southwest Point?—A. Yes; we do remember.

Q. Were there thousands and thousands lying there undisturbed—that there were no drives made from that point?—A. There were no drives made from there for many years, notably—1872, 1873, 1874, and 1875—and yet there were thousands and thousands there and at Zapadnie and Middle Hill, from which we made no drives.

Q. Do you remember the small rookery and the hauling grounds on Professor Elliott's map just west of Zapadnie, and called by him "Kursoolah?"—A. Yes; we remember it distinctly—there was a small rookery there and a large hauling ground.

Q. Are there any seals hauling there to-day, or have you seen any seals at Southwest Point?—A. No; there is nothing there to-day but growing grass—where it used to be covered with seals from point to point.

Q. Do you remember the hauling grounds west of Middle Hill, in English Bay and Zapadnie, in 1872, 1873, and 1874?—A. Yes; it used to be covered with seals in those years; we drove them from English Bay—from half-way over only—and even then we would often leave half of the seals behind, and were often obliged to divide the drives into four or five divisions because the seals were so numerous.

(The above answer was given by Kerick Booterin, who at that time was chief.)

Q. Do you remember the hauling grounds of Polavina, and is it true that in Mr. Elliott's time there were thousands upon thousands of young male seals hauled upon those grounds undisturbed by any driving from beginning to end of the seasons of 1872, 1873, and 1874, inclusive?—A. Yes; there were lots of seals there, thousands upon thousands, undisturbed.

Q. Do you remember the hauling grounds of Stony Point and the beach around it?—A. Yes, we know the place well, and there were seals scattered there all along it.

Q. Are there any seals there to-day?—A. No; they are all gone.

Q. Do you remember the hauling grounds between Webster's house and Polavina?—A. Yes; and there used to be lots of seals there, especially at a point called "Dalnoi."

Q. Are there any seals there to-day?—A. No; there are none there. We drove there this year, but could not get more than 100 seals.

Q. Do you remember old man Webster in 1872 to 1874 at Northeast Point and where he got his seals in those days?—A. Yes; we do remember. Artamonov was then second chief and worked with Webster six weeks.

Q. (To Artamonov.) Is it true that Webster got all his seals from that strip of sand beach on the north shore, west of Cross Hill?—A. Yes; there were always a sufficient number.

Q. Did Webster drive from or near a rookery then at Northeast Point?—A. No; he never allowed the men to go near a rookery.

Q. Where do they drive from at Northeast Point to-day?—A. They drive from all around the point.

Q. Do they go among the cows to get out the holluschickie?—A. No; they go right above the cows and drive from the very edges.

Q. Was any man now present at a drive at Northeast Point this year?—A. Yes, three of us.

Q. At what date were you there?—A. At the beginning of the season and during the third week.

Q. Were any of you at Northeast Point since the "podding" or "spreading" out of the cows and pups occurred?—A. No.

Q. (To Kerick Booterin and to Artamonov.) Were you born at Northeast Point and what are your ages?—A. Yes; and Artamonov is now 65 and Booterin is 61.

Q. (To same two men.) Do you remember whether there were more or less seals before 1872 than then (1872–1874) or afterwards?—A. In 1868 the hauling grounds and rookeries were at their very fullest—the entire ground from the lake upward being covered with seals.

Q. When did you first notice the shrinking or scarcity of seals, and when did you first talk about it among yourselves?—A. In 1877 we first began to notice that the holluschickie were getting fewer, and have continued from that year to grow less and less.

Q. At what time did you talk among yourselves as to when the time would come when there would be an end to the seal business?—A. (By George Booterin.) I began to see in 1877 that this trouble was ahead, but whenever I or my people spoke about it we were told by the company men ("Americans") (sic) that it was not of our business and we must not talk about it. Whenever we talked about the seals the company men threatened to send us away from the island.

Q. (By Mr. Goff to Booterin.) Was that the reason you would not talk to me last year?—A. I hardly remember now why I did not like to talk about the seals.

Q. What do you men think of the effect on seal life of the driving of the seals?—A. When the old Russian Company drove, and the drivers came in here, they never killed anything over a 3-year-old; all over that were either never disturbed or else spared, and if the same thing had been practiced ever since there would be no scarcity of seals to-day.

Q. How many 3-year-olds do you think you can get next year?—A. If they were to drive all the seals on this island next year they would get nothing, and would only disturb and injure the rookeries.

(By Kerick Booterin.) Whenever any killing is allowed, if they never kill any over 3 years old, and kill only 3 years old and under, I believe there would be no injury done.

Q. Do any of you remember the zapooska of 1834?—A. Yes; Booterin and Artamonov remember it well.

Q. How many seals were killed after the first year of that order, and how were they killed?—A. The first year we killed only 100 holluschickie, and we increased the number every year afterwards.

Q. What do you think of another zapooska for to-day?—A. (By Kerick Booterin.) When the Russians ordered their zapooska, little by little afterwards, everything grew better, and if the same thing is repeated to-day, everything will grow better, and if it is not done, no seals will come here. We observed that the men sent here by the Government since old Captain Bryant, till we saw you men and talk now with you, took no interest in the seals, but whenever busy, were engaged in shooting our hogs; in fact, they very seldom visited the rookeries.

Q. Did you men ever talk or attempt to talk about seal life to any of the Government officers before Mr. Goff's time?—A. Yes, on several occasions, and they answered—and they answered we did not know anything about it.

Q. Have you any questions you would like to ask the Government?—A. Yes; we want to know what is to be done about the seals.

Mr. ELLIOTT. We propose to immediately inform the Secretary of the Treasury of the exact condition of affairs, and we know that he will take care of the seals and the people too. He is the only man who can talk, but he sent us here to get the facts and he will act upon that information. None of us in Washington knew of the true condition of affairs up here. Until Mr. Goff wrote down last year to the Secretary of the Treasury, not a word has ever gone from here since 1870, which even hinted at any danger to the seals.

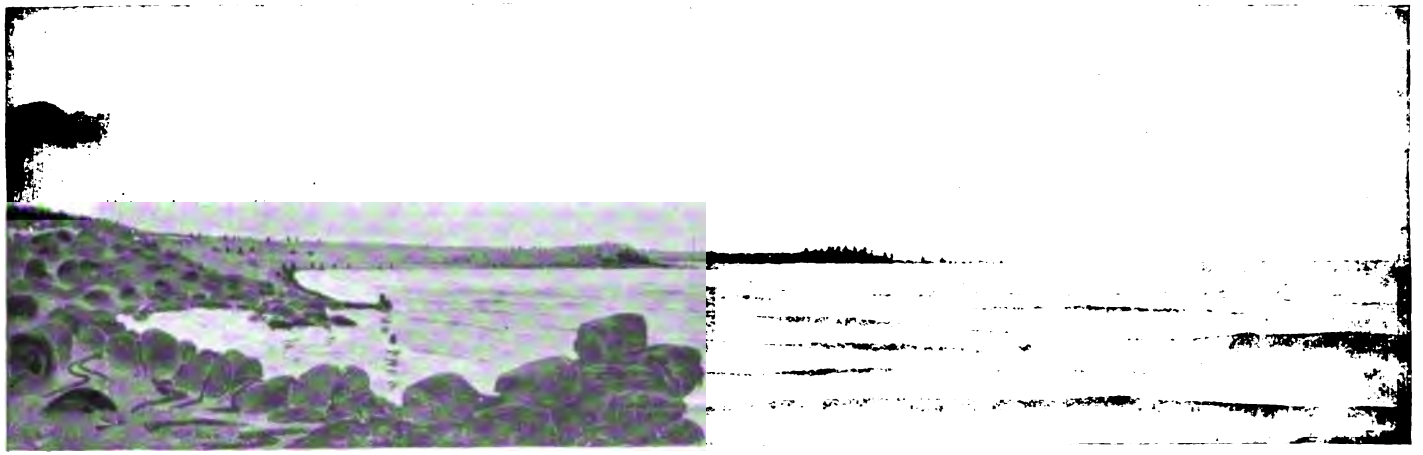
KERICK BOOTERIN. We think had it not been for Mr. Goff the seals would all be gone. We are not now afraid of being hungry, although we can not take seals.

Mr. ELLIOTT. We want you natives to understand that the Government cares more for the preservation of the seals than for any money that may be received in the form of a tax.

The interview closed at this point.

The foregoing statements are made *only by those natives who in 1872–1874 were old enough then, to really observe and think;* these men are the only survivors of that age when I was on the island in 1872. When the above interview was in progress Kerick Booterin during the whole time held a small notebook in his hand, open, and not seeing

PLATE 47.



A drawing from nature by the author.

SEA LION NECK, NORTHEAST POINT, OR NOVASTOSHNAH, SAINT PAUL ISLAND, JULY, 1890.

View looking north from Webster's Point, over the abandoned hauling and breeding grounds of the fur seals. This neck was the favorite trapping place for the capture of sea lions in 1872-1874 by the Aleuts; it is the best locality on the Pribilof Islands for that purpose.

him make any notes or refer to it, at the close of the talk he was asked by the interpreter what he wanted to do with the book—what he had there. He then showed us the following written statement (in Russian) which he said he made for me, as he was not certain whether we should meet and talk or not, before I left the island:

[Translation.]

AUGUST 6, 1890.

Pardon me, Mr. Elliott, I never call myself a big man, but now I shall talk what I know, and will not tell what I do not know.

I think that as the hauling grounds were they will be if the drives were made and the killing made from small ones, the large ones spared. If that is done, I think all will be well. If that is not done, more harm will come to the rookeries so that there will be no more hauling out on the rookeries. If a zapooska is made, I think all will be well. If the zapooska is not made, then we will lose the land if the Treasury does not look out. If the hauling grounds could sustain the company, then the grass and everything like it would not grow there now. This loss will fall upon us and upon our children. We can not longer sit quiet and talk about there being lots of seals.

GENERAL MEMORANDA CONCERNING THE SEAL ISLANDS.

ST. GEORGE VILLAGE, *July 29, 1890.*

In many respects a resident here enjoys a far more pleasurable life than if stationed at St. Paul. He has a finer view of the sea, which in storms, boils at his feet in surf of surprising power, or laves the black basaltic base of the village cliff, in low rippling murmurs when calm days prevail. He can see from morning until night, endless flocks of waterfowl, from the 26th of every April until the end of every October, flying to and from the uplands and cliffs, some days beating their way stubbornly against a stiff head wind or darting off through the fog or mist like bullets from a gun.

I notice a great increase in the floral display over that exhibited here in 1873–74; indeed, I think that the flowers at Garden Cove are as numerous and as beautiful as can be seen on St. Paul. They were not so in 1873.

The grass in and around the village here is the finest turf in Alaska; it is a close-growing fine-speared species or variety that very closely resembles the blue grass of Kentucky. The seal "road" leading to the eastern rookery is of this sod, sodded smoothly, and it crops out on the south side at Garden Cove especially attractive.

Such a compact, smooth, glassy green turf makes the little hamlet here look attractive, as it is kept clean everywhere and not littered or strewn. The water here is abominable, however—nothing but the seepage from the hilly tundra back of the village—and perhaps owes much of its "flatness" to that drainage which it represents of the "Choochkie" ridges, which breed here by millions from June to August 30 and September 10, all over the uplands around the town.

On St. George in 1868 no regular list was made of the number of seals taken, but it seems likely from all I can gather that at least 30,000 were killed. On St. Paul, also, no regular count was made, but H. M. Hutchinson and Daniel Webster, who were on the ground then sealing there, assure me that the number did not exceed 240,000. This was followed in 1869 by the killing of 60,000 or a few more on St. Paul and St. George for natives' food, the skins being salted, and finally taken by the Alaska Commercial Company next year—i. e., most of them—since they did not get possession until August, 1870, and then the sealing season was substantially ended for the year.

The condition and appearance of this little town of St. George is one of good order and cheerfulness. The 21 native houses here are occu-

pied by 98 souls. There were 120 when I was here in 1873. The little streets or roadways are clean and well drained. The grass in and about the village is much better than at St. Paul, and a small sheep paddock directly under the window of the Treasury agent's house is one that suggests a Kentucky blue grass meadow most forcibly.

GENERAL MEMORANDA.

THE FOOD OF THE FUR SEAL AND ITS RELATION TO THE FISHERIES OF ALASKA AND THE NORTHWEST COAST.

In my monograph of the seal islands of Alaska (p. 64) I called attention to the amount of fish that a fur seal probably consumed every day on an average throughout the year, showing that these animals undoubtedly required and secured some 6,000,000 tons of fish as food annually. I said:

Think of the enormous food consumption of these rookeries and hauling grounds; what an immense quantity of finny prey must pass down their voracious throats as every year rolls by. A creature so full of life, strung with nerves, muscles like bands of steel, can not live on air, or absorb it from the sea. Their food is fish, to the practical exclusion of all other diet. I have never seen them touch, or disturb with the intention of touching, one solitary example in the flocks of waterfowl which rest upon the surface of the water all about the islands. I was especially careful in noting this, because it seemed to me that the canine armature of their mouths must suggest flesh for food at times as well as fish; but fish we know they eat. Whole windrows of the heads of cod and wolf fishes, bitten off by these animals at the nape, were washed up on the south shore of St. George during a gale in the summer of 1873. This pelagic decapitation evidently marked the progress and the appetite of a band of fur seals to the windward of the island, as they passed into and through a stray school of these fishes.

How many pounds per diem is required by an adult seal, and taken by it when feeding, is not certain in my mind. Judging from the appetite, however, of kindred animals, such as sea lions fed in confinement at Woodward's Gardens, San Francisco, I can safely say that 40 pounds for a full-grown fur seal is a fair allowance, with at least 10 or 12 pounds per diem to every adult female, and not much less if any, to the rapidly growing pups and young holluschickie. Therefore, this great body of 4,000,000 and 5,000,000 of hearty, active animals which we know on the seal islands must consume an enormous amount of such food every year. They can not average less than 10 pounds of fish each per diem, which gives the consumption as exhibited by their appetite of over 6,000,000 tons of fish every year. What wonder then that nature should do something to hold these active fishermen in check.[1]

An old sea captain, Dampier, cruising around the world just about two hundred years ago, wrote diligently thereof (or, rather, one Funnel is said to have written for him), and wrote well. He had frequent reference to meeting hair seals and sea lions, fur seals, etc., and fell into repeating this maxim, evidently of his own making: "For wherever there be plenty of fysh, there be seals." I am sure that, unless a vast abundance of good fishing ground was near by, no such congregation of seal life as is that under discussion on the seal islands could exist. The whole eastern half of

[1] I feel confident that I have placed this average of fish eaten per diem by each seal at a starvation allowance, or, in other words, it is a certain minimum of the whole consumption. If the seals can get double the quantity which I credit them with above, startling as it seems, still I firmly believe that they eat it every year. An adequate realization by ichthyologists and fishermen as to what havoc the fur-seal hosts are annually making among cod, herring, and salmon of the northwest coast and Alaska would disconcert and astonish them. Happily for the peace of political economists who may turn their attention to the settlement and growth of the Pacific Coast of America, it bids fair to never be known with anything like precision. The fishing of man, both aboriginal and civilized, in the past, present, and prospective, has never been, nor will it be, more than a drop in the bucket contrasted with the piscatorial labors of these ichthyophagi in those waters adjacent to their birth. What Catholic knowledge of fish and fishing banks anyone of those old "seecatchie" must possess, which we observe hauled out on the Pribilov rookeries each summer. It has, undoubtedly, during the eighteen or twenty years of its life explored every fish eddy, bank, or shoal throughout the whole of that vast immensity of the North Pacific and Bering Sea. It has had more piscine sport in a single twelvemonth than Izaak Walton had in his whole life.

Bering Sea, in its entirety, is a single fish-spawning bank, nowhere deeper than 50 to 75 fathoms, averaging perhaps, 40. There are also great reaches of fishing shoals up and down the northwest coast from and above the Straits of Fuca, bordering the entire southern, or Pacific, coast of the Aleutian Islands. The aggregate of fish food which the seals find upon these vast ichthyological areas of reproduction must be simply enormous, and fully equal to the most extravagant demand of the voracious appetites of *Callorhini*.

Using the above as a suggestion, several writers have hastily assumed that it would be a good thing if the seals were exterminated; that by exterminating them, just so much more would be given to our salmon and cod fishermen to place upon the markets of the world. These men forget the fact that all animal life in a state of nature, existing to-day as the fishes and seals do, is sustained by a natural equilibrium, one animal preying upon the other, so that year after year only so many seals, so many cod, so many halibut, so many salmon, so many dogfish, and so on throughout the long list, can and do exist.

Suppose, for argument, that we could and did kill all the seals; we would at once give the deadly dogfish (*Squalus acanthias*), which family swarms in these waters, an immense impetus to its present extensive work of destruction of untold millions of young food fishes, such as herring, cod, and salmon fry, upon which it feeds.

A dogfish can, and does destroy every day of its existence, hundreds and thousands of young cod, salmon, and other food fishes—destroys at least double and quadruple as much as a seal. What is the most potent factor to the destruction of the dogfish? Why, the seal himself; and unless man can and will destroy the dogfish first, he will be doing positive injury to the very cause he pretends to champion if he is permitted to disturb this equilibrium of nature, and destroy the seal.

OFFICERS OF THE GOVERNMENT.

List of resident Treasury agents who have served on the seal islands of Alaska from 1869 to 1890.

CHIEF SPECIAL AGENTS.

No.	Name.	Seasons of service.
1	Charles Bryant	1869 to May 20, 1877.
2	John M. Morton	1877 to 1878.
3	Harrison G. Otis	1879 to 1881.
4	Henry A. Glidden	1882 to July 1, 1885.
5	George R. Tingle	1885 to April, 1889.
6	Charles J. Goff	1889 to date.

ASSISTANT SPECIAL AGENTS.

7	Samuel Falconer	1870 to 1876.
8	Henry W. Elliott	1872 to 1873.
9	Francis Lessen	1872 to 1874.
10	George Marston	1875 to 1877.
11	William J. McIntyre	1874 to 1876.
12	J. H. Moulton	1877 to 1882.
13	B. F. Scribner	1879 to 1880.
14	John W. Beaman	1879 to 1880.
15	W. B. Taylor	1881 to August 3, 1881.
16	George Wardman	1881 to May 29, 1885.
17	Louis Kimmel	1882 to 1883.
18	Herbert G. Fowler	1884 to July 1, 1885, only.
19	A. P. Loud	1885 to 1889.
20	Thomas J. Ryan	1885 to 1886.
21	J. P. Manchester	1886 to 1889.
22	William Gavitt	1887 to 1888.
23	Joseph Murray	1889 to date.
24	S. R. Nettleton	1889 to date.
25	A. W. Lavender	1890 to date.

In addition to the above list of names of regularly specified seal island agents of the Treasury Department, S. N. Buynitsky, a clerk in the customs division, Office of the Secretary of the Treasury, was detailed as a temporary agent and served through the season's work of 1870 on St. George, three months; then he passed another period of nine months on St. Paul, from July 31, 1871, to April 26, 1872, in charge. But he was not regularly enrolled or appointed as a Treasury agent for the seal islands.

In 1874, under order of special act of Congress, Henry W. Elliott and Lieut. Washburn Maynard, U. S. N., made an elaborate and detailed survey of the seal life, as embodied on these islands.

SEAL PIRATES AND THEIR WORK ON THE ISLANDS.

The following citations from the daily journal of the Treasury agent's office on St. George Island in reference to the visits of marauders or pirates are given to show the general impression made at the time, means of prevention, etc.

September 10, 1884.—Schooner reported at Zapadnie.

September 11, 1884.—About 12.45 a. m. we noticed boats coming toward the shore. * * * As a warning to let them know, and not to land, we fired a half dozen shots. The marauding boats immediately turned about and disappeared in the fog and darkness (p. 376).

July 2, 1885.— * * * About 5 o'clock the watchman came over from Zapadnie with the news that a schooner was in sight, and its crew were catching seals in the water by shooting. * * *

July 3, 1885.—The men we sent to Zapadnie yesterday evening * * * returned early this morning, reporting they could see no pirates or signs of any (p. 413).

July 20, 1885.— * * * The men with the boat brought the information that they had seen marauders near Starry Arteel rookery. * * * We failed to catch the rascals, but found their marks in the shape of many seal skeletons, some fresh, showing that they had been killed but the night before.

June 22, 1885.—(At same place.) * * * On the arrival of Mr. Morgan and myself on the ground we found the marauders gone, but their work left on the beach, 120 seal skins and evidence enough to satisfy the Government agent that between 600 and 700 seals had been killed, nearly all females. * * * We found hundreds of skinned seals hid under rocks and in caves (p. 419).

September 7, 1885.— * * * The marauders who are in the habit of hanging around this island at this season of the year are keeping themselves at a distance this year, for which we are very much obliged (p. 427).

June 19, 1886.—At 3 a. m. this morning the chief reported that the two watchmen at Starry Arteel discovered within 400 feet of shore a ship's boat, and they fired four shots in all and the boats left. This occurred about 1 a. m. * * * Arkenty reported no vessels at Zapadnie last night, but fog was heavy and it was dark (p. 469).

August 6, 1886.—Dense fog. Went to Starry Arteel rookery, taking chief with me to see the dead seals reported found there yesterday. They had been killed by clubbing and had evidently been dead a week.

August 9, 1886 — * * * Schooner sighted about 8 a. m. some 6 miles to the north, heading west. Soon after natives reported seeing a boat just off bluff at West Point. * * * Two boats close in shore at West Point. Fired upon them, when they at once pulled out into the fog in direction of the schooner.

September 24, 1886.—At about 1 p. m. the revenue steamer *Bear* came to anchor in front of the village. * * * Captain Healy reports that in his opinion all marauding vessels (six) have left these waters (p. 487).

November 17, 1888.— * * * At 12 m. saw a schooner from the village at the west end of the island heading to the northwest. Sent second chief and three men to Zapadnie, etc.

November 18, 1888.— * * * Nothing seen of the schooner to-day. Second chief returned to village and reports that some persons had landed, as there was fresh tracks, and the windows of the native house were all broken. No signs could be discovered of much damage being done to the rookery, as the few seals left there at this time are all quiet (p. 196).

September 30, 1889.— * * * Messenger from Zapadnie reported that men had landed and killed seals on the rookery last night.

October 1, 1889.— * * * At 10 o'clock p. m. three boats hove in sight and came up to within a few yards of where we were concealed. Here they separated, one

going toward the end of the rookery and two steaming toward the center of the rookery, * * * so I fired across the nearest boat and gave orders to the men to fire. Instantly the boats turned and pulled for the open sea (p. 277).

October 21 and 22, 1889.—Schooner anchored off Zapadnie 21st. Captain came ashore on 22d and spoke to watchmen at Barrabkie, saying he belonged to the Alaska Commercial Company. Compasses out of order, etc., bound for Kamchatka. Natives refused to go aboard with him, and he went off and got under way—left. Nothing seen of him since, and no other vessel this year.

DESTRUCTION OF SEAL PUPS BY KILLER WHALES CLOSE AROUND THE ROOKERIES, IN THE SEA.

The following citations from the Treasury agent's journal on St. George Island refer to the appearance of the killer whales (*Orca gladiator*) and the havoc they create. There is but one brief entry of the kind in the St. Paul journal. I am not surprised at it, however, because I did not see a killer whale around St. Paul during the whole of my visit there last season, May 21 to August 11, inclusive. But at St. George, the letter of Captain Lavender, which follows, declared the presence of a great many.

September 15, 1881.—A school of apparently 10 or 12 killers ran into the shoal around the near rookery to-day and soon made havoc among the pups. It was estimated from the manner in which the seal were thrown up out of the water that 25 or 30 were eaten by their greatest enemies.

September 18, 1881.—Another visitation of killers similar to that of 15th instant (p. 269).

May 9, 1882.--A school of killers were also seen this morning for the first time since the seals left last fall (p. 286).

October 29, 1882.—The weather being fair and favorable to-day, I made a trip to Starry Arteel rookery, noticing on my way there that a good many so-called killers were chasing and destroying young pup seals in the sea off the beach (p. 304).

September 3, 1885.— * * * The killers put in an appearance in force about the beginning of this month, remaining or coming near every day up to this date, to the great discomfiture (sic) of the pups. The number of pups devoured by them must be great (p. 429).

May 5, 1886.—Three killers passed by to-day—the monsters (p. 456).

September 14, 1887.— * * * A school of killers made their initial appearance. There were about eight in the school. They passed the length of the island three times and killed all the seal and sea lion they could get.

September 22, 1887.—Killers again appeared this afternoon. There were about 15 of them. They passed from east to west and killed many seals.

October 16, 1887.— * * * A school of killers, about four in all, came at 8.30 a. m. from east (p. 39).

October 19, 1887.— * * * Killers came again this evening, passing from east to west. Their work, as usual, very destructive. The gulls followed, picking up remnants of meat.

October 21, 1887.—Killers at an early hour this morning, and they cleared the sea of all the seal that were in it at the time (p. 50).

July 1, 1888.— * * * Killers have been in this vicinity for a week, and were in front of village all afternoon (p. 158).

October 23, 1888.— * * * There are many pup seals in the water now, and we often see killers among them. I think that they kill many of the pups (p. 192).

In a letter addressed by Capt. A. W. Lavender on this subject to the writer, he says:

I am now stationed on St. George Island as Treasury agent, and not having been long enough on the island to be a competent judge as to the number of seals destroyed annually by these monsters, I have asked the opinion of gentlemen who have spent every season for the last ten years here, and the answers to all my inquiries have been that this species of whale must be destroyed or the seal rookeries will be something of the past in a short time. They also informed me that during the month of October, when the pups first take to the water, they are killed by the thousand, and that the water along the shore of the rookeries is red with the blood of young seals, which fall easy victims to these monsters, having no fears of them. * * *

He closes with the following sensible recommendation:

The next Congress should make an appropriation sufficient to furnish two whale boats and crews with all the modern improvements for the killing of whales, and to

station one boat and crew on each island during the ensuing year, with orders to patrol the islands, daily if possible, and destroy this whale whenever an opportunity is afforded. These boats should be in charge of experienced whalemen from some part of the New England States, where this whale and other similar species exist in large numbers. There would be no trouble in obtaining men who are well versed in this kind of whaling, and it is my opinion at the end of the year it would be found that killers were very scarce and would not come near the shore, while their appetite for seal and seal pups would be changed so much that codfish and other similar varieties would be good enough for them. I shall endeavor to write more fully on this subject in the near future when I have had a little more experience on the islands, as I consider it one of great importance.

Truly, yours, A. W. LAVENDER.

CERTAIN OFFICIAL SURVEYS OF THE SEAL ROOKERIES.

Extracts from the journal of the office of the Treasury agent on St. George Island, in reference to the number of seals thereon, show that several of the assistant agents over there have paid considerable attention to this important subject by making field observations in the breeding seasons since my published work of 1874. *The journal of the St. Paul office does not give any similar evidence of attention until the season of 1889*, or until the notes of Mr. Charles J. Goff were entered last year. All final surveys and population notes of the breeding grounds made before the seals arrive, and not when they are to be seen at the right time for measurement of area and position, viz, July 10 to 20, inclusive, are valueless. In 1884 a distinct note of warning was sounded from St. George by Assistant Agent Wardman; the St. Paul office, however, gave it no attention.

The first survey made after my work of 1873–74 was the following, which seems to have been made in all sincerity; but the extraordinary allotment of space which he gives to the seals, 2 feet in some places and 8 feet in others, is due to the fact that he must have struck those particular 8, 4, and 5 feet areas when the pups were podding back and the cows scattered with them. The work, however, bears evidence of pains and sincerity and is entitled to respect. I made that season of 1874 a total of 162,402; he makes it 198,648 breeding seals and young. His figures of sea margin and average depth show, when contrasted with mine, that his tapeline, and the podding, which it is evident that he encountered, were not safe factors for a close calculation.

This calculation of William J. McIntyre is copied from his autograph entry in the journal of the Treasury agent, St. George Island.

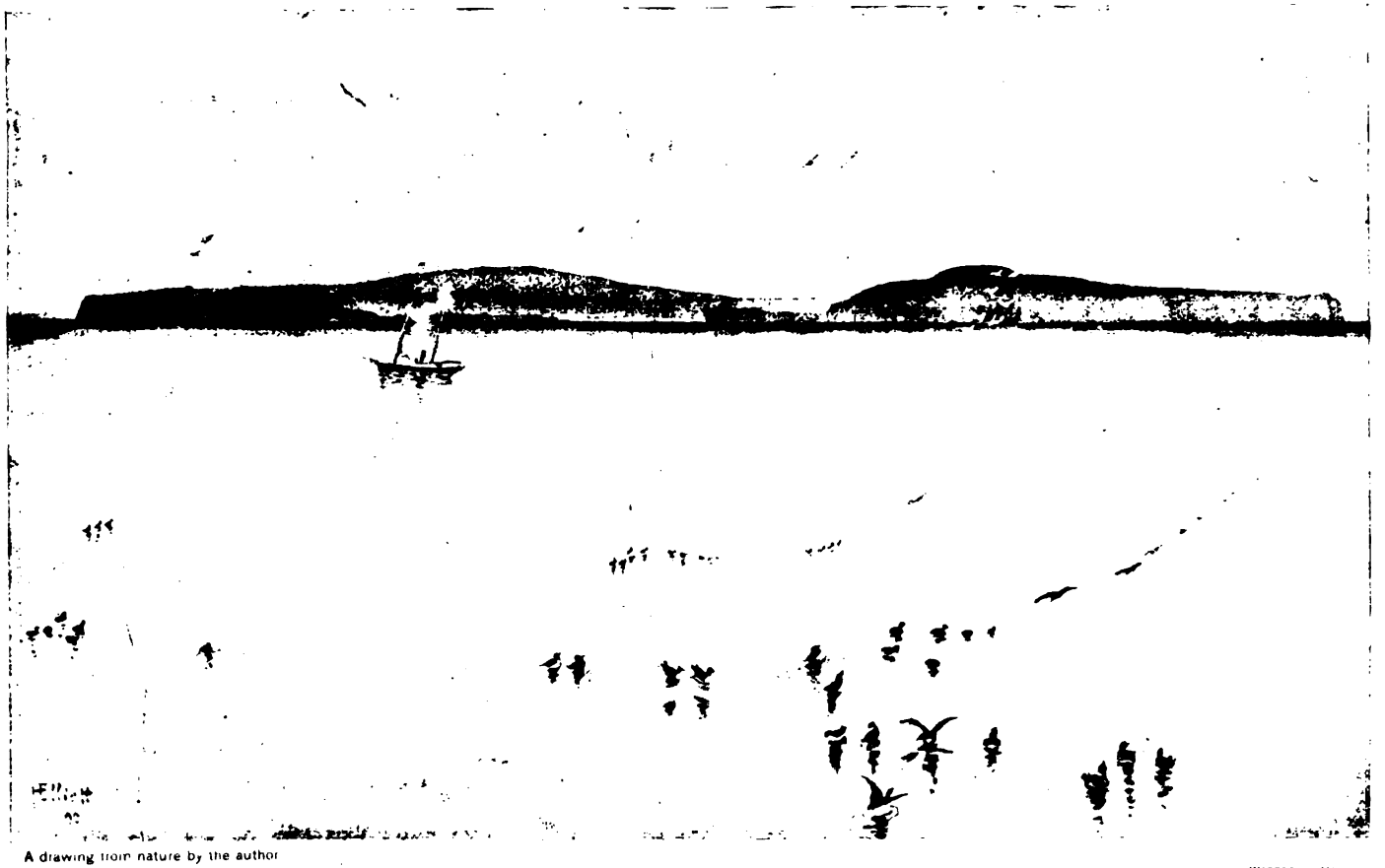
Table showing the present condition of the breeding rookeries on St. George Island, from a survey made by William J. McIntyre.

[The limits of expansion were defined in the middle of July, 1874, and measured in April of the following year.]

Rookeries.	Length of shore line.	Average breadth.	Space allowed for each seal.	Total bulls, cows, and pups.
			Sq. feet.	
Zapadnie	875	136	5	24,600
Starry Arteel	650	173	3	24,150
North:				
First part	900	41	2	18,450
Second part	900	54½	8	6,112
Third part	1,000	124	2	62,000
Little East	650	72	3	12,356
East:				
First part	260	240	4	15,600
Second part	1,240	49	2	25,380
Total	6,475	111½	*a* 3¾	198,648

a Average.

PLATE 48.



A drawing from nature by the author

DALNOI MEES.
(N.¼W., 10 miles distant.)

ZAPADNIE ROOKERY.
(NNE., 7¼ miles distant.)

WATERFALL HEAD.
(NE. by N., 9 miles distant.)

VIEW OF THE SOUTH SHORE OF SAINT GEORGE ISLAND, PRIBILOF GROUP.

Taken from the *Rush*, August 5, 1890.

With all due deference to Mr. Elliott's opinion that 2 square feet of ground for each seal on the breeding rookeries is approximately correct, I am inclined to the opinion that this is too liberal an estimate for all of the rookeries. In some cases I have allowed 2 square feet, in others 3, 4, 5, and 8 square feet, according to the topography of the ground, its adaptability for breeding purposes, and the condition of the rookery at the time of its greatest expansion, i. e., about the middle of July. It would be utterly impossible for any series of measurements to give the accurate number of seals that haul up on the breeding rookeries or hauling grounds. The least that can be done under the circumstances is to form some basis for measurement during the middle of July, mark the limits of the breeding grounds, and measure them carefully with a tapeline, as was done in this case, before the seals return. This will give their approximate number, and, if carefully done, will not be far out of the way; still these figures are not exact and should be proven by the measurements of 1875.—WM. J. MCINTYRE.

With that work of Assistant Agent McIntyre, all effort in this line by him or his successors seems to have ceased, and not until 1886 was the subject taken up again:

CONCERNING THE OFFICIAL REPORTS OF CERTAIN UNITED STATES TREASURY AGENTS, 1886–1888.

In my letter of introduction to this report I allude to the extraordinary fact that the official reports of the Treasury agents in charge of the public interests on the Pribilov Islands, for the years 1886, 1887, and 1888, *declare a great increase of fur-seal life on these islands then*, over my large figures of 1872–1874; that they make this declaration to the Secretary of the Treasury in spite of or ignorance of the truth, *which was just the reverse!* The trouble with these responsible agents of the Government on the islands at that time was that they were mainly engrossed with contemptible personalities between themselves, which caused them to forget and neglect the chief object of their official duty.

The following extracts from the official and regular daily journal of the United States Treasury agent on St. George Island are enough, and will give a very clear understanding of what they were busy about at that time, when the seals were vanishing rapidly from the hauling grounds and fading out on the rookeries.

[Extract copied by the author from Treasury agent's journal, St. George Island, Alaska (official record), p. 166.]

July 30, 1888.—Str St Paul arrived from St. Paul Island at 4.30 a. m. She took on board 9,948 skins. The Rush soon came and Mr. Tingle came ashore. We had a long talk and I gave him a history of affairs on this Island. At the finish of the history he said that he had no fault to find with me and thought that the Co's men had given me a hard time. (Gavitt.)

July 31, 1888.—Mr. Tingle remained ashore. This morning he was receiving from me a verbal statement of how the Co's men try to blacken the character of every one with whom they conflict, when one who was present (*Capt. Loud,*) and should know better became abusive and wanted to fight because my statements "reflected on some of his friends." *Mr. Tingle said he believed my statement and intended reporting the matter to the A. C. Co. of San Francisco.* The lie was passed between several and the meeting was lively. Its time that a Gov't officer can come here without being called a thief, drunkard etc. This made some dirty talk to Mr. Tingle about me and I proved to Mr. Tingle how they talk about every one, and after I told him he was perfectly satisfied. (Gavitt.)

Aug. 1st, 1888.— * * * The Rush and St. Paul still at anchor. Mr. Tingle, Clark Mead and several natives went on board. * * * (Gavitt.)

Aug. 2d, 1888.— * * * The Rush and St. Paul at anchor all day. No one came ashore. A boat containing Loud Jack Hall, the cook Alex. Lugebil and some natives (the Oostigoff tribe) went out at 2 p. m. and remained until 3.30 p. m. As they went on board, I suppose some of them had a lot of filth to dump but as Mr. Tingle said on 31st that he was sick of the way things are here, I hardly think Mr. Tingle held any investigation, because he would have come ashore or sent for me. * * * (Gavitt.)

William E. Gavitt remains in charge of St. George until he boards the steamer *St. Paul*, August 9, 1888, en route for Evansville, Ind., on "a leave of absence."

Then he is succeeded by Capt. A. P. Loud, who has been living on this island of St. George with him all summer (as his assistant), and who then takes up the journal for the first time. All entries up to date of August 10, 1888, are in Gavitt's handwriting and name, as the assistant agent in charge of the island.

Captain Loud commences his first service as assistant agent in charge, on page 174, by making an unintroduced entry of the following letter of George R. Tingle. [I am obliged to copy it *verbatim et literatim*.]

[Extract copied from United States Treasury agent's journal, St. George Island, by the author, p. 174.]

ST. PAUL ISLAND, *Alaska, Aug. 10, 1888.*

Capt. A. P. LOUD,
Assistant Treasury Agent in charge of St. George Island.

SIR: in the matter of the charges and complaints of Wm. Gavitt, Assistant Treasury Agent against the Alaska Commercial Cos. Employees on St. George Island as spread on the Journal in the Treasury Agents office, and as Set forth to me in his letter of 3d June on file in this Office I have to say that I made an exhaustive investigation into the whole matter complained of to me taking the sworn statement of those persons who had wintered on the Island with Mr. Gavitt as well as his own statement: The affidavits of Dr. C. A. Luts, Daniel Webster and Eugene Kirk disproves wholly all the charges made by Mr. Gavitt, whilst the recital to me by Mr. Gavitt, himself on the occasion of my visit to St. George Island on 30th ulto, only strengthened the Statement of Others and leaves him in the unenviable position of having been the main cause of disturbing the harmony and personal friendly relations whitch Existed amoung the White peopel of the Station, whare I left him in charge one year ago. Many of the things complained of and recorded by Mr. Gavitt in the public journal *improperly* are of a trivial nature not proper to be written in the Journal. I can only excuse Mr. Gavitt's conduct in many things on the ground of ill health, in taking this Extremely Charitable view I must in Justice say that he manifested a disposition of insubordination to his Superior Officer and was quarrelsome to a degree whitch became unbearabel, many of the entries in his Journal are absolutely false and disgracefull so mutch so that I cannot refrain from placing on record in the Journal this Letter and thairfore ask you to Spread it in full upon the Journal With such additional Endorsements by you whitch your associations and knowledge of Mr. Gavitt warrent.

(Signed) GEO. R. TINGLE, *Treasury Agent.*

I have been living in the house with Mr. Gavitt for the past sixty seven days and am well acquainted with him. I have no hesitation to say that he is neither truthful nor honerable and that his actions words and general behavior were a disgrace to any man holding a position under our Government.

A. P. LOUD,
Ast. Treas. Agt. St. George Island.

AUG. —, 188–.

In the clear light which the above-quoted extracts throw upon the occupation and concern of these agents of the Treasury Department, I wish to make an especial record of those particular reports made to the Secretary of the Treasury, which, being utterly incorrect and misleading, gave infinite aid and comfort to the cause of the pelagic hunters, and worked serious harm to the public interests of our Government.

[The bogus official report of 1886.]

OFFICE OF SPECIAL AGENT TREASURY DEPARTMENT,
St. Paul Island, Alaska, July 31, 1886.

SIR: I herewith transmit my report of the operations of the sea islands for the past year and up to the close of this sealing season.

* * * * * * *

Mr. Elliott embraced in his report of 1874 a measurement by him of the breeding rookeries on this island, made July 10 to 18, 1872, since which time no measurement has been made so far as the records of this office show. Deeming it of great importance that the Department should be in possession of the best information as to the present

condition of the rookeries, I made a thorough measurement of all on this island, commencing on the 3d day of May, before the bulls hauled up on the land, when an absolutely correct measurement could be made.

In making my measurements I was assisted by Dr. L. A. Noyes (Captain Loud, assistant Treasury agent, not having returned to the islands) and four of the best-informed natives. As to the boundaries of the breeding rookeries in July, when the rookeries were fullest, we verified our work by observation, and found the ground included within our lines fully covered some of the rookeries, viz, Northeast Point, Tolstoi, Garbutch, Polivana, were densely packed, covering more area than my statement shows, while others were not so closely packed. I do not agree with Mr. Elliott in his assignment of 2 feet square to each seal; at this date it is not enough.

I inclose my statement, marked E, as compared with Mr. Elliott's, which on his basis gives us now on the breeding rookeries 5,148,500 seals, an increase since 1872 of 2,137,550. I think the calculation of 1872, as well as 1886, would stand a reduction of one-fourth in aggregate number of seals, and be nearer the true number than our figures show. Statements at best are merely approximate estimates, but in the absence of any absolutely correct method of arriving at the count, they serve as a guide. Frequent inspection of the rookeries during last season and this shows a decided increase of cows, with an ample supply of bulls. The same report is also made by the assistant Treasury agent in charge of St. George, on which island I was not able to obtain measurements of the rookeries this spring, but will do so next, and forward the result with my next report.

* * * * * * *

GEO. R. TINGLE, *Treasury Agent.*

E.—*Measurement of breeding rookeries, St. Paul Island, Alaska.*

Rookery.	By W. H. Elliott, assistant Treasury agent, July 10 to 18, 1872.				By George R. Tingle, Treasury agent, May 3 to 8, 1886.			
	Sea margin.	Width.	Total area.	Total seals, allowing 2 feet square to each female seal.	Sea margin.	Width.	Total area.	Total seals on Elliott's basis.
			Feet.				*Feet.*	
Reef	4,016	150	602,400	301,200	5,550	175	971,250	485,625
Garbutch	3,660	100	366,000	183,000	2,750	275	756,250	378,125
Zoltoi	.....	.....	.....	.....	700	30	21,000	10,500
Keetavia	2,200	150	330,000	165,000	2,700	140	378,000	189,000
Lukannon	2,270	150	340,500	170,250	1,660	175	280,000	140,000
Tolstoi	3,000	150	450,000	225,000	3,100	250	775,000	387,500
Lagoon	750	100	75,000	37,500	1,625	75	121,875	60,937
Northeast Point	15,840	150	2,376,000	1,188,000	14,825	205	3,039,125	1,519,563
Polivana	4,000	150	600,000	300,000	6,600	175	1,155,000	577,500
North Zapadnie	.....	.....	.....	.....	5,500	100	550,000	275,000
West Zapadnie	5,880	150	882,000	441,000	3,800	550	2,090,000	1,045,000
Sea Lion Rock	.....	.....	.....	.....	1,100	145	159,500	79,750
Total	41,616	.....	6,021,900	3,010,950	49,850	.....	10,297,000	5,148,500
Increase in 14 years	.....	.....	.....	.....	8,234	.....	4,275,100	2,137,550

NOTE.—Zapadnie is divided by a sand beach over 700 feet wide at the Southwest Bay landing. In order to show the shape of the rookery better, I call that portion north of the sand beach North Zapadnie and the other side West Zapadnie. Mr. Elliott treats it as one rookery; he also leaves out Sea Lion Rock, which is an old rookery. Zoltoi is new since his date. I think the space assigned to each seal by Mr. Elliott is not large enough, and a reduction of one-fourth from the figures above would give more nearly correct the actual number of seals on the rookeries named.—GEORGE R. TINGLE, Treasury agent, St. Paul Island, Alaska.

(Senate Ex. Doc. No. 7, Forty-ninth Congress, second session.)

[The bogus official report of 1887.]

OFFICE SPECIAL AGENT, TREASURY DEPARTMENT,
St. Paul Island, Alaska, July 31, 1887.

SIR: I have the honor to transmit herewith my report for the year ending July 31, 1887, with the steamers' receipts for 100,000 seal skins.

* * * * * * *

I have made frequent and close inspections of the rookeries this year, and find the lines of occupancy extended beyond those of last year, and the cows quite as densely packed on the ground on most of the rookeries. While on two rookeries

there is some falling off, it is certain, however, this vast number of animals, so valuable to the Government, are [sic] still on the increase. The condition of all the rookeries could not be better, and the seals undisturbed when ashore, seem to take great comfort out of their season of rest after a long winter's voyage at sea.

* * * * * * *

GEO. R. TINGLE, *Treasury Agent.*

(Senate Ex. Doc. No. 31, Fiftieth Congress, first session.)

[The bogus official report of 1888.]

OFFICE OF SPECIAL AGENT OF THE TREASURY DEPARTMENT,
St. Paul Island, Alaska, July 31, 1888.

SIR: I have the honor to transmit herewith a report of the operations of the fur-seal islands of Alaska for the year ending July 31, 1888.

* * * * * * *

The breeding rookeries were later filling this year than for several years past. I may say that fully three-fourths of the cows and bulls were ten days later hauling out than usual, which at the time gave the impression there would be a shortage this season of killable seals, as well as breeders.

I am happy to be able to report that although late landing, the breeding rookeries are filled out to the lines of measurement heretofore made, and some of them much beyond those lines, showing conclusively that seal life is not being depleted, but is fully up to the estimates given in my report of 1887.

* * * * * * *

GEO. R. TINGLE, *Treasury Agent.*

(Senate Ex. Doc. No. 90, Fiftieth Congress, second session.)

[Treasury agent's journal, St. George Island (pp. 12, 13).]

June 15, 1887.—The following was received on the 13th:

"*Measurement of rookeries by Dr. Noyes, acting assistant Treasury agent, St. George Island, January 4, March 1, and April 22, 1887.*[1]

Rookery.	Sea margin.	Width.	Square feet.	Seals.
East	2,200	200	440,000	220,000
Zapadnie	2,100	160	336,000	168,000
Little East	600	125	75,000	37,500
Starry Arteel	900	575	517,000	258,750
Near North	3,500	300	1,050,000	525,000
Total	9,300	.....	2,418,500	1,209,250

"The measurement of the above rookeries by H. W. Elliott July 12–15, 1873, gives as the total of males, females, and young seals on the breeding rookeries, 163,420, while the company killed 25,000 seals on St. George, or one-fourth of the catch.

"The same officer gives the number of breeding seals on St. Paul Island July 10 to 18, at 3,030,250, or twenty times the number on St. George, and yet only three times the number of seals were taken on St. Paul. It is evident that Mr. Elliott's measurements of St. George rookeries were not correct, or the company could not have taken 25,000 from so small a showing.

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[1] With reference to this official entry in the St. George journal, the following note from my journal should be transcribed in simple justice to Dr. Noyes:

VILLAGE OF ST. GEORGE, *July 25, 1890.*

Dr. L. A. Noyes, who made the measurements of the rookeries of St. George Island in 1887, long before a breeding seal had made its appearance upon them, and who sent them over to St. Paul to George R. Tingle, who in turn under date of June 10, 1887, orders them spread upon the record as "absolutely correct" (neither man had ever seen, up to that hour, the rookeries when covered with breeding seals as specified in these measurements aforesaid), this day personally entered a disclaimer to me as to any responsibility for these estimates of the numbers of seals on the St. George rookeries, which Tingle declares "absolutely correct." He said to me that he did not know anything about surveying; that he made those measurements of space in length and depth at Mr. Tingle's request, and sent them over without making any estimates of the number of seals that might be within the lines of his measurements. That estimate of 1,209,250 seals on the St, George rookeries in 1887 was made wholly outside of his knowledge or suggestion.

"The very careful and correct measurements by Dr. Noyes shows the true condition of the rookeries, and is in proportion to the St. Paul Island seal population as follows:

Island.	Sea margin.	Square feet.	Seals.
St. Paul	49,850	10,297,000	5,148,500
St. George	9,300	2,418,500	1,209,250

"St. Paul quota (sic) 85,000, St. George quota (sic) 15,000. To equalize the income of the natives on the two islands, the company allows the St. George men to assist on the St. Paul Island, where they earn about 3,000 each year—equal to taking 7,500 additional seals on St. George as far as the St. George natives' income is concerned."

Please enter the foregoing in your journal for future reference.

I am, respectfully,

GEO. R. TINGLE, *Treasury Agent.*

ST. PAUL ISLAND, *June 10, 1887.*

OFFICIAL NOTES ON THE SEALS AND THE DRIVING.

[Extracted from the Treasury agent's journal, St. George Island.]

Saturday, June 30, 1877.— * * * The month has been rather dry for killing seal, but yet a large number has been killed, a much larger number than has been taken in June in any previous year since the island has been in the hands of the Alaska Commercial Company. The number taken this month is 9,987, lacking only 13 of being as many as was taken in the whole season of 1876. The highest number ever taken in June was 8,343 in 1872. The number taken in June last year was 3,397. The first drive last year, June, was 108. The first drive this year was made June 1, and numbered 198. This drive of 198 has been equaled only once; that was in 1873, when 198 were driven, June 4. It will be seen by the above comparisons that there was an increase of seals the 1st of June, which continued throughout the month. During this month there has been but one drive from Zapadnie, on account of the prevailing dry weather. At this date there are at least 5,000 seals on that rookery large enough to kill. The last drive this month was made from East rookery, numbering 1,589, and several hundred were left on hauling grounds.

After conferring with Mr. Morgan, the company's agent, and the chief of this island, I am convinced that there is a large increase of all classes of seal this year over last year for the month of June. But whether this increase will continue to the end of the hauling season remains to be seen.—J. H. MOULTON, *Assistant in Charge.*

Tuesday, July 10, 1877.— * * * The natives made a drive of 880 seals from East rookery. This is the last drive for the season of 1877, making 14 drives in all, numbering 15,000 seals altogether. The number allowed by law to be taken from this island this season was 15,000. It is hoped that the Alaska Commercial Company will decide to take 17,000 the next season, in order that the natives may get out of debt.—J. H. MOULTON (p. 115).

Sunday, July 15, 1877.— * * * Mr. Morgan, company agent, the chief, and myself visited Zapadnie rookery to make a careful examination of its condition; and, after a careful examination, came to the conclusion that there is an increase of all classes of seals over last year of 33⅓ per cent. The chief informs me that there are more seals on all the rookeries than in any former year. * * * —J. H. MOULTON.

Tuesday, June 28, 1881.— * * * The drive to-day numbered about 1,600, an unusual number of 1 and 2 year olds, too small to kill. This has been the case with almost every drive thus far this season. Drive for East rookery: Seals killed, 746; skins accepted, 744; rejected, 2.—W. B. TAYLOR (p. 260).

July 16, 1881.—This makes a grand total of 20,000, the full quota for 1881; skins all salted to-day.—W. B. TAYLOR (p. 265).

June 14, 1882.—An examination of all the rookeries on the north side this afternoon demonstrates that there were not more than 400 or 500 holluschickie hauled out, which was not considered enough to make a drive desirable. Considerable numbers of holluschickie haul out under the cliffs of North and East rookeries, from which places they are driven out with a view to forcing them to other localities where they may be available for driving to the killing grounds.—G. H. WARDMAN (p. 290).

June 21, 1882.—As the holluschickie have taken to hauling in considerable numbers under the cliffs of East and North rookeries, from which they can not be obtained for killing, small flags saturated with kerosene were to-day set among the rocks at those places with a view to frightening the seals to other grounds. On the men visiting the flagged places a short time afterwards, the seals were found sleeping between the flags. They do not scare.—G. H. WARDMAN (p. 291).

June 30, 1882.—The prevailing character of the June weather this year was light and dry. There was more or less fog on 27 days, but generally it was very light, and frequently modified by sunshine.—G. H. WARDMAN (p. 291).

June 30, 1883.— * * * The month of June has been very unfavorable for sealing this year, only 2,674 skins having been taken in that time. This number might have been increased at Zapadnie by killing the seals there, numbering some 2,000 or more, which were held as a reserve to draw upon in case the quota, 15,000, should not be available on the north side of the island. The number might also have been enlarged this month had the Alaska Commercial Company not determined to take larger skins in the aggregate than heretofore of late years. An effort is now made not to kill seals the skins of which will not weigh 8 pounds at least.—G. H. WARDMAN (p. 327).

June 23, 1883.—On East rookery and Starry Arteel the gradual increase in the number of females and pups is easily seen day by day, but the accessions to the holluchak party are not so apparent.—G. H. WARDMAN (p. 326).

July 19, 1882.—The year's quota of 20,000 was filled to-day.—G. H. WARDMAN (p. 293).

THE FIRST NOTE OF WARNING FROM ST. GEORGE.

[Treasury agent's journal (p. 331).]

Standard, nothing less than an 8-pound skin.

July 27, 1883.— * * * Skins from Starry Arteel, North, and East rookeries, 606, out of a drove of about 6,000 seals.

Having those 6,000 seals on hand at the village from the drive yesterday afternoon, the writer of this set out at 7 o'clock this morning to view the hauling grounds from East to Little East rookeries. There were then in sight about 1,500 holluschek (sic) which had hauled out yesterday afternoon and last night. Allowing as many holuschek (sic) to be in the water along the beach as were hauled out, and supposing as many along Starry Arteel and North as East, we should have 12,000 on the north side of the island. Judging from the killing at Zapadnie this year, there should be at least 6,000 over there. Call it 8,000, and we have all we can claim—20,000 holuschek (sic) about the island, of which at least one-half are yearlings, which, if all return, will be too small for market next year. If all of the holuschek (sic) which we believe to be about the island return, we may be able to fill a quota next year of 10,000. *It now appears that more than 10,000 could not safely be demanded of St. George for 1884.*[1]—G. H. WARDMAN.

SECOND NOTE OF WARNING FROM ST. GEORGE.

[Treasury agent's journal (p. 338).]

September 7, 1883.—At East rookery, while there are seals scattered all along from Little East to the main East rookery, *it does not seem that there are so many as in 1881.* But there may be more in the water, as the long-continued southerly wind makes small surf.

September 14, 1883.—Heavy surf on north shore, sending nearly every seal to land. From a careful examination of Little East to-day, am satisfied that there are not so many seals there as two years ago; would not estimate present number at above 8,000 of all kinds, including pups. Assistant Agent McIntyre estimates 12,356 there in 1874. Elliott's estimate was 13,000 in 1873.—G. H. WARDMAN.

September 16, 1883.— * * * Most of seals being ashore in consequence of heavy surf, a careful view of North and Near rookeries was made to-day. In 1874 Assistant Agent McIntyre estimated the number of seals there at 86,562. The writer would consider that an extreme outside figure for the seals there now.

September 25, 1883.— * * * At East rookery, seems not so many seals there now as a month later in 1881. * * * —G. H. WARDMAN.

September 5, 1884.—Walked along the cliffs and beaches to Little East and East rookeries. After careful examination, estimate number of seals of all kinds at Little East 12,000, and East 23,000. Scattered along the beach between rookeries, 100; under the cliffs beyond East, 500. At East rookery there were about 800 sea lions. On account of the surf, most every seal was on shore.—G. H. WARDMAN (p. 374).

September 8, 1884.— * * * At North and Starry Arteel rookeries: After careful examination, estimate number of seals of all kinds at North 75,000, and at Starry Arteel 40,000; under the cliffs beyond North about 500. The heavy surf of the past week has driven and kept ashore almost every seal. Many of them were hauled way back on the grass.—G. H. WARDMAN (p. 375).

September 2, 1885.—Walked to North rookery to-day. Was surprised at not finding the great numbers of seals on the rookery that has been recorded as seen by other

[1] On July 30 the quota of 15,000 big skins was all taken, save 473 skins still to be taken.—WARDMAN.

agents in other years. So far, from observations made, I think someone has greatly overestimated the number of seals on the rookeries at any time.

Elliott, I think, comes nearer the number than any of his successors.—T. F. RYAN (p. 427).

July 26, 1886.—With all due respect for the work, measurements, and conclusions of Messrs. Elliott and McIntyre, I am forced, from close observation and tests made on the work of both, to the following conclusions:

First. That Mr. Elliott's measurements are much nearer the mark than Mr. McIntyre's, and he (sic) is at least 1,000 feet of shore-line rookery by 50 feet in width too much.

Second. That Mr. Elliott's opinion that 2 feet square of ground for each seal or 4 feet square for cow and pup, even taking into consideration the topography of the ground, is none too liberal. The lay of cows and pups at birth are very close.—T. F. RYAN.

June 21, 1886.— * * * The rookeries upon this island are looking finely and are showing many bulls, cows, and pups. The seals are coming unexceptionably fine and plenty for killing. The Alaska Commercial Company have already taken 1,000 more than they took one year ago this time, being about 5,000 to date.—J. P. MANCHESTER (p. 470).

June 26, 1886.— * * * The seals for the past week have been coming in very slow; expect them to do better soon.—J. P. MANCHESTER (p. 472).

July 5, 1886 (Monday).— * * * We are now 23 skins behind last season. The seals are coming a little slow.—J. P. MANCHESTER (p. 475).

July 7, 1886.— * * * The seals come very slow; hope they will do better soon.—J. P. MANCHESTER (p. 477).

July 15, 1886.— * * * Mr. Ryan measured Little East rookery, in company with the chief, and called it 350 by 40 feet, well covered with cows and pups, and appeared quiet and happy, with big showing of pups. He estimates 7,000 cows and pups.—J. P. MANCHESTER.

July 22, 1886.—Counted in 527 skins killed yesterday. The company wants 294 more to fill their quota of 15,000. * * * —J. P. MANCHESTER.

July 23, 1886.—To-day the Alaska Commercial Company took 294 seals. * * * —J. P. MANCHESTER.

July 1, 1887.— * * * Counted into salt house 100 skins, result of yesterday's drive from Starry Arteel and North rookeries. This, I suppose, is the smallest drive ever made upon these islands, and is discouraging. The seals are late, and the constant driving of them, which stirs up the rookeries, does them no good. * * * —WILLIAM GARITT (p. 18).

Tuesday, June 22, 1888.— * * * We think from the outlook under the next lease the Government will get a revenue of not less than $500,000 a year from the seal off St. Paul and St. George islands. We think 150,000 can be taken each year instead of 100,000, especially if the Government will commence at once and give them good protection. The crop of seal are (sic) big upon these islands, "the largest and best in the world."—J. P. MANCHESTER (p. 471).[1]

St. George, September 25, 1888.— * * * Made an examination of all the rookeries on the north side. Estimate about 2,000 killable seals.—A. P. LOUD (p. 187).

St. George, July 10, 1889.— * * * It is feared by Mr. Clark, of the Alaska Commercial Company, that we can not get our quota of skins this year. The seals are coming in very slowly.—JOSEPH MURRAY.

With that entry of Colonel Murray of the 10th of July, 1889, I close the St. George official extracts: and, turning to the official entries on the

[1] This exhibition of total misunderstanding of the real and threatening condition of the fur-seal herd, deliberately placed at this hour in the official journal, was undoubtedly the honest belief of Mr. Manchester at the day he made the entry quoted. This particular officer was a gentleman in every sense of the word. He was never engaged or concerned in petty, bitter personalities while upon these islands: but, he was a very large, fleshy man, and not able to walk on tours of rookery and hauling-ground inspection, and was thus obliged more or less to form his idea of what the real condition of the hauling grounds and rookeries was from the statements of others in whom he trusted. He undoubtedly gained his opinion from the official reports of his superior officer, Chief Special Agent George R. Tingle. The Treasury agents on the seal islands should not only be mentally fitted for the discharge of their duties, but they should also possess an athletic physique, with capacity and disposition for untiring pedestrianism over rough, wet ground. Unless they are so endowed, they can not properly view and truthfully record the condition of the hauling and breeding fur seals from week to week during the season. Unless they can do, and do do this work, they are of no good service or value; their appointment is an imposition on the Government, in so far as the seal islands are concerned.

pages of the St. Paul journal, *I find nothing there of the character cited from the St. George records*, i. e., direct entries made from field observation like those quoted above, *until I reach the record of last year*. They are summed up in the following direct, significant warning, which that gentleman (who uttered it) promptly embodied in his report to the Treasury Department, thus giving the first direct information on file in the secretary's office which warned him of the true state of affairs up there.

September 1, 1889.— * * * Dr. Lutz and myself took a walk to the Reef this afternoon. The old bulls are about all gone, pups are getting rather large, and could be seen by thousands playing in the water. Yet I am satisfied that they are not near so numerous as in the past. It is impossible to continue killing 100,000 seals per annum and expect a continuation of seal life and a revenue to the Government. My observation this summer of the rookeries have fallen far short of my expectations after reading Elliott and others on seal life.—C. J. GOFF. (Treasury agent's journal, St. Paul Island, p. 173.)

FIELD NOTES RELATIVE TO PELAGIC SEALING—IN RE SEAL PIRATES, AND MINGLING OF RUSSIAN AND AMERICAN SEAL HERDS.

OONALASHKA, *August 13, 1890.*

From what I saw yesterday as I came down on the *Arago*, from what Captain Tanner of the *Albatross* informs me, and from what I learned through the collector here, there is no doubt but that a number of pelagic sealers are at work in Bering Sea at the present hour: and getting everything that they can lay their hands upon in the form of fur seal.

We ran down upon a typical sealing schooner yesterday morning, about 7 o'clock, as she was partly becalmed, about 60 miles north of Akootan Pass. She had her sails at first clewed up: but, as we drew near, she hoisted her foresail and jib and lazily drew off so as to turn her stern away from sight, in order that her name might not be taken. But, we ran clear around so as to disclose the name "*Ariel*, St. John, N. B.," in white letters on her black hull, under her stern. We passed so near to her that we could look right down upon her crowded deck—crowded with northwest-coast canoes and Indians, so that there was hardly moving room on her.

She was a small schooner, not over 50 tons, and extremely shabby in her equipment: rigging frayed and slack, sails patched like a crazy quilt, and the crew made up entirely of Indians (some thirty or thirty-five), except three white men. The Indians were dressed in blanket coats or shirts, with their flaps overhanging; some breeched and some unbreeched. Their canoes were telescoped on deck precisely as the dories of a Gloucester codfisherman are packed or stowed.

They all crowded up on the diminutive poop deck of the schooner, and stared at us in mingled fear and wrath, while some one of the white men ran below, and reappeared with a rifle under his arm.

The name of the schooner being disclosed, the *Arago* bore away, and when the craft was some 5 miles astern, we saw her canoes dropping down for seals—she had 8 or 10 canoes. I am not certain as to the count, but not any less, that is sure. These Indians use both spears and guns.

Captain Tanner says that last week when at work, 60 miles west-northwest of St. Paul Island, on the 100-fathom line, he saw two schooners anchored, with their boats out sealing. The skinned carcasses of the seals that they had shot, were floating everywhere.

The collector here says that he has been informed by these men who have been running in here frequently during the last three weeks, ostensibly in distress, but really to find out where and what the cutters were

and doing, that the catch outside of Bering Sea up to July 1 was 47,000 skins. These skins were shipped on a special Victoria steamer by the sealers at a common rendezvous at Sand Point, and at Thin Point, or Sannak Island, before they ventured into Bering Sea. This is an enormous catch, and must have been wholly taken from the cows, since there are little or no male seals left. The collector says that out of the 67 skins which he seized, the sealers informed him that 60 were females when killed, *all being with their unborn young!*

Certainly, the absence of seals in the water as we came down yesterday, over a sea that was smooth and glassy, was surprising. We saw but four young seals on the entire stretch between Oonalashka and the island of St. George. The opportunity for viewing these animals never could be better, and the inference is unavoidable that they are rapidly running out.

I find the opinion commonly expressed here, as it was when I first came up, that the active, uninterrupted shooting and hunting of these seals on the several paths of travel up to the seal islands from the Pacific on one side, has deflected large bodies of them over to the Russian rookeries. It stands to reason that a fleet of forty or forty-five or more vessels, all hovering about the entrances to the passes of the Aleutian chain on the Pacific side—the passes of Oonimak, Akootan, and Oonimak especially—that such a reception would head off and turn aside a regular, orderly migration of these animals. How many of them are thus turned over to the Russian herds, which really belong to us, I have no idea; who can say? But at this present hour every seal lost to the rookeries of the Pribilov group counts heavily against the future life and preservation of those interests.

Touching this matter of the commingling of the two herds, I can not think of a better illustration of the fact that they do not visit back and forth on the islands—do not interchange on the islands—than the following: Farmer A has a large number of chickens, white Leghorns, which he breeds in his barnyard year after year, with great success. Farmer B, who lives up and beyond, across the country road from Farmer A, also has a fine flock of these same white Leghorn fowls, which he, too, breeds with great success and profit, and has done so for a long time.

Now, during the summer months, a number of these chickens reared by Farmer A regularly range out into the country road, up and down, in search of food, and, in so doing, meet and scratch together with the fowls of Farmer B, which come also out into the roadway in obedience to the same instinct. Anybody seeing them together on this common meeting ground, could not possibly tell them apart as the special property alone of Farmer A or B.

But, the chickens never make a mistake; they invariably separate and return every evening to their respective barnyards, where they were hatched and reared.

So it is with these fur seals of the Russian and Alaskan herds in Bering Sea. I believe that they, like the fowls above described, meet each other frequently when feeding throughout the waters of Bering Sea, that roll between the Asiatic and American seal islands of their birth; but that they always return, when desirous of hauling out on land, to the rookeries on which they were born; the Russian fur seals always returning to the Commander Islands, and the Alaskan *callorhini* always returning to the Pribilovs.

Abnormal conditions might change this fixed habit of their lives; as far as I know to-day, no such conditions have prevailed.

Captain Tanner has been cruising in Bering Sea, between Oonalashka and Bristol Bay, and as far to the westward as longitude 175° west, latitude 59° north, and has seen but three schooners up to date. Two of those vessels were in the full tide of sealing, as above stated, 60 miles west of St. Paul Island, and the other was a rusty little craft just above Amak Island, west of Oonimak Island. But that does not signify that there are no more—on the contrary, it is very likely that there are more.

A careful inquiry here to-day, discloses the fact that fur seals have never hauled on the beaches of Oonalaska Island: and have never come into the harbor here, within sight of the natives, except for a few days only: when strong northerly gales prevail: and, as soon as it becomes calm, they go out again and down into the Pacific. From time immemorial, fur seal pups have been shot and speared every fall, in November chiefly, as they migrated south into the Pacific from Bering Sea. Anywhere from a few hundred to 2,500 annually have thus been secured since the Russians first opened up the country in 1768–1786. The best resort for such hunting is Oomnak Pass; it was in the past, and is now. It was this annual passage of these animals, down in the autumn and up in the summer, through these passes of the Aleutian Archipelago, that aroused the first search of the Russians for the seal islands.

The scarcity of seals this year has been commented upon by the fishermen of Alaska, who declare that they have been getting larger catches this season than ever before, and lay the change to the decrease of seal life. Captain Tanner says that he has seen several of these men who have charge of canneries and codfishing stations at Oonga and Popov islands; they all said that unquestionably the increase of fish was due to the decrease of seals; if not wholly due to that, it certainly was in a measure. I am by no means inclined to regard the circumstance as noteworthy to any appreciable degree whatever; nor can I believe much in the deflection of any large body of fur seals from the Aleutian passes up to our side of Bering Sea and the Pribilov Islands. There is not as yet enough ground covered by these sea hunters to make that abrupt turn down south of the Aleutian chain of the fur-seal herd, wherein too long, too wide, and too frequent an opportunity exists for them to go wholly unmolested up to their places of birth in Bering Sea. They might be so headed off by a cordon of hundreds of schooners hovering steadily in the mouths of these passes, with the wind and weather always clear and calm, still water, and foggy only at short intervals; but such is not the case here; the weather is treacherous, the winds rise and blow for days and days; the fog settles and hangs for weeks and weeks so thick that the oldest and most experienced seamen actually get lost in its confusion. During these periods, the fur seals can and do pass safely through into Bering Sea, no matter how many schooners, filled with no matter how many hunters, may be in the waters outside waiting to intercept them.

Then, when it does clear up, becomes calm, and the horizon is visible in every direction, these pelagic hunters can and do work rapidly and successfully during the brief intervals which such weather affords; brief, I say, because the clear, calm, bright day off the Aleutian chain and in its passes, is a rare one, and is easily remembered during each season. Therefore, I do not feel warranted in believing that as yet, any deflection by hunting in the open waters of the ocean has been made to or in that path of migration regularly pursued by the fur seal.

I think that such a deflection might be caused by the withdrawal of large schools of food-fish supply from the Aleutian Bering Sea region—by its abandonment of this region and location in the Occident—such

a course would be quite sufficient, since the seal is a hearty feeder and would follow its source of food supply. But fish are now more abundant, if anything, than ever thus far in the waters of the Alaskan Coast, and the seals have no cause on that score to deviate from their regular route of travel.

LOSS OF SEALS BY PELAGIC HUNTERS.

Witnesses under oath before the House Committee on Merchant Marine and Fisheries, Fiftieth Congress, second session, report No. 3883.

T. F. Morgan (p. 64). Q. What number of seals are recovered that are killed in the waters?—A. I could not state it as a positive fact, but I should say not over 50 per cent.

W. B. Taylor (p. 54). Q. When they kill the seals in the water, about what proportion of them do they recover?—A. I do not believe more than one-fourth of them.

C. A. Williams (p. 87). Q. And the conditions are as bad?—A. Yes, sir; and often worse, for this reason: If you kill a pup you destroy a single life, but in killing a cow you not only destroy the life that may be, but the source from which life comes hereafter, and when they are killed there in the water by a shotgun or spear, the proportion saved by the hunters is probably not one in seven. That was their own estimate, that out of eight shots they would save one seal and seven were lost. If they were killed on the land, those seven would go toward filling up their score.

H. H. McIntyre (p. 118). Q. What proportion of the seals shot in the water are recovered and the skins taken to market?—A. I think not more than one-fifth of those shot are recovered. Many are badly wounded and escape. We find every year, embedded in blubber of animals killed upon the islands, large quantities of bullets, shot, and buckshot. Last year my men brought to me as much as a double handful of lead found by them embedded in this way.

George R. Tingle (p. 164). Q. The waste of seal life was only 53 in 1887?—A. Yes, sir; in securing 100,000 skins, while these marauders did not kill, last year, less than 500,000. The logs of marauding schooners have fallen into my hands, and they have convinced me that they do not secure more than one seal out of every ten that they mortally wound and kill, for the reason that the seals sink very quickly in the water. Allowing one out of ten, there would be 300,000 that they would kill in getting 30,000 skins. Two hundred thousand of those killed would be females having 200,000 pups on shore. Those pups would die by reason of the death of their mothers, which, added to the 300,000, makes half a million destroyed. I am inclined to think, because the seals show they are not increasing, or rather that they are at a standstill, that more than 300,000 are killed by marauders.

T. F. Ryan (p. 220.) The number of seals taken by marauders from seal islands, or in the waters nearby, are very few in comparison to the great numbers taken in the 50 or 60 miles south of the islands. Old seal hunters seldom bother the islands, and from the information to be had, 95 per cent of seals taken by seal hunters in Bering Sea are taken at a distance of from 40 to 75 miles south of St. George Island, and 90 per cent of those taken are cows, the producers.

Capt. L. G. Shepard (p. 237). Q. It has been stated in testimony here that not one out of five, six, or seven of the seals wounded in the water are recovered. I think you put the estimate a little lower than that. Have you any knowledge on the subject?—A. I think they recover about one-half.

Capt. C. A. Abbey (p. 246). Q. What was your opinion about that?—A. In the earlier days they shot them with bullets and with rifles, and when they are shot with a bullet the seal sinks, and probably out of half a dozen they would not get more than one. If the seals are not killed, but simply wounded, that leaves a chance to get them into a boat. They were very expert hunters who hired for that purpose, but I judge that they killed about three for every one they got. I got that from the conversation with the hunters themselves.

J. C. Redpath (p. 316). Q. And if they wound a seal in the water, the seal is likely to sink before they can recover it?—A. There is no doubt about that.

Q. What proportion do they recover of those that are killed by firearms in the water?—A. Very few, I should suppose. I have never seen a seal shot in the water. I have known of sea lions that if wounded in the water could be recovered, but if shot and killed they will sink.

Q. In your judgment, what proportion of seals that are shot in the water are recovered?—A. It is hardly possible to recover one-half of them.

H. H. McIntyre (p. 332) submitted the following extracts from the log of the schooner *Angel Dolly*, kept by Capt. Alfred N. Tulles, who was accidentally killed by his own hand on the 28th of July, 1887, near Otter Island:

July 4, 1887.—Hove to 30 miles southwest of St. George Island. At 1.30 out boats. Got 5 seals.

July 5, 1887.—Out boats at 6.30 a. m. Returned at 11.15 p. m. with 11 seals, one boat getting 6.

July 9, 1887.—I am now on the hunting ground, but keep sail on the vessel as we may pick up a sleeping seal.

July 11, 1887.—Caught 7 seals.

July 13, 1887.—Caught 12 seals; they were around the vessel as thick as bees (the seal). Had it been clear we would have caught 100 easy.

July 16, 1887.—Saw 3 sleeping seals from the vessel. Got boat over and got them. I have not seen the sun for nine days, therefore I have had no observations, yet I know that I am not over 14 miles from St. George Island.

July 17, 1887.—Out boats at 10.30 a. m. The seals were around the vessel in hundreds. The boats would not go any distance from the vessel. Had they gone away they could have caught 200 or 300 seals. They were afraid of the fog, yet I told them that it would clear up, which it did at 3.30 p. m., and continued thus all the rest of the day. They are the hardest set of hunters that were ever in Bering Sea, who caught 20 seals and used 250 rounds of ammunition. They get 1 out of every 10 they fire at. Well, I will never be caught with such a crowd again. The head hunter fired 100 shells and got 6 seals. The vessel is lying between the islands of St. Paul and St. George. Just as soon as the fog clears off the land I will have to move, as I might have the cutter after me. I came here to get a load of seals, and by God, if I had any men with me, I would get them, too. They are all a set of curs, genuine ones, too.

July 21, 1887.—Out boats at 6.30 a. m., coming back to vessel at 9 p. m. One boat returned at 7 p. m. This was the head hunter. He is out last and first back always. Caught 30 seals; one boat got 14. This is the best day's work we have done yet. From the amount of growling among the boat pullers I conclude that they fired at and missed nearly 200 seals. They had 100 loaded shells each when they left the ship, and when they came back all were emptied, so they did some tall firing.

July 23, 1887.—To-day I asked Daniel McCue, boat puller for Charles Loderstrom, how it was that his boat got only 9 seals. I told him that I had seen 40 sleeping seals from the vessel, and that he must have seen more as he was pulling about. His answer was that if he had a man that knew how to shoot, that the boat could not carry all the seals that were missed. "Why, Captain," said he, "it is enough to discourage a man. You pull up to a sleeping seal to within 10 feet, fire at him and see the shot go 6 feet the other side of him." I then asked J. Linquist, puller for boat two. He said: "Captain, don't ask me how many we have seen, but ask me how many we missed, and I will tell you." I asked him the above question; he said 100. I now asked Joe Spooner the same questions as above; his answer was, "We only want hunters, and we would be going home now with 1,500 skins at the very least."

July 24, 1887.—As fine a day as was ever seen in San Francisco. A flat calm with the sea smooth as glass. Got out the boats at 6.30 p. m., coming back at 7.30 with 14 seals. Why, one boat with an ordinary hunter could get that many without going 100 yards from the ship. I killed 2 inside of ten minutes, and it was then nearly dark.

July 25, 1887.—Nice weather. Out boats at 7 p. m. Came back with 4 seals. Big catch.

July 26, 1887.—There were thousands of seals around the vessel. I shot and killed 7 from the vessel, but only got 1, through the tardiness of the hunters. At 4.30 I put the boats out; came back at 7.30 with 1 seal. The water was fairly covered with seals, yet they only caught 1.

The log closes on the 28th of July, 1887, on which day the captain was killed and his vessel seized for violation of the revenue laws.

His signals were: (1) Come back to the vessel; (2) want a boat for dead seal; (3) keep near the vessel; bad weather or fog; (4) cutter in sight.

This paper is a transcript of the log book of the schooner *Angel Dolly*, captured by Mr. Tingle in July, 1887.

I introduce this sworn evidence, above quoted, because it may be the honest, and doubtless is the honest understanding of these gentlemen: But, as for myself, I do not believe that they, or any man knows how many seals he kills, injures slightly or fatally, or misses outright, after the close of a day's hunting on the water: *he can not know;* for each and every seal that he fires at, *is going to instantly disappear;* and he only gets those seals that he kills outright, or dazes or stuns: *the others, not hit, or wounded fatally or slightly, all dive instantly and speed away from his retrieving!*

NUMBER OF SEALS.

Witnesses under oath before the House Committee on Merchant Marine and Fisheries, Fiftieth Congress, second session, Report No. 3883.

1885–1887.

T. F. Ryan (p. 211). Q. Will you state about the location of these islands and the condition of the seal rookeries while you were there?—A. St. George Island is in Bering Sea, 180 miles to the northwest of Unalaska, one of the Aleutian chain of islands. It is an island about 6 miles wide and 10 miles long, to which 175,000 to 200,000 seals annually—male, female, and pup—resort.

1885–1888.

G. R. Tingle (p. 162 et seq.). Q. What is your observation as to the number of seals resorting to the islands annually; are they diminishing or increasing?—A. Upon that subject, if it is in order, I would like to answer the question by reading from my report to the Treasury. May I inquire if it is in Mr. Elliott's evidence that he made his statements as to the seal life upon the islands from personal observation?

The CHAIRMAN. Yes; and estimates.

The WITNESS. Was it shown that Mr. Elliott had not been on the fur-seal islands for fourteen years?

The CHAIRMAN. His evidence was that he was last there in 1876, twelve years ago.

The WITNESS. He made a statement that there was no greater number of seals upon the islands now than at the time he measured the rookeries. Since I have been on the islands I have observed very closely the breeding rookeries. I have visited them daily, remaining around and observing them for hours at a time. I gave them very close attention. The reason I did so was that I desired to be able to place the Department in possession of the very best information I could in regard to this seal property, whether it was increasing or diminishing. I found on the islands this book of Mr. Elliott's, giving his measurements of the seal rookeries, and I conceived the idea of making some measurements myself on the Elliott basis, to find out if the seals were increasing. Mr. Elliott's measurements of the fur-seal islands showed an area of 6,021,900 square feet, and he says that upon that basis there are 3,010,950 seals. Taking Mr. Elliott's basis, I made measurements fourteen years after his, and they showed an increase of 8,234 feet in sea margins of the rookeries, and an increase of 4,275,100 feet of superficial area occupied by breeding seals, showing upon St. Paul Island, at the time I made my measurement, 5,148,500 seals, or an increase of 2,137,500. The number of seals at present shown to be on the breeding rookeries of the two islands is as follows:

St. Paul Island	5,148,500
St. George Island	1,209,250
Total	6,357,750

1883.

W. B. Taylor (p. 59): Q. Is it your opinion that a larger number of seals may be taken annually without detriment to the rookeries?—A. No, sir; I would not recommend that. The time may come, but I think that one year with another they are taking all they ought to take, for this reason: I believe that the capacity of the bull seal is limited, the same as any other animal, and I have very frequently counted from 30 to 35, and even at one time 42 cows with one bull. I think if there were more bulls there would be less cows to one bull, and in that way the increase would be greater than now. While the number of seals in the aggregate is not apparently diminished, and in fact there is undoubtedly an increase, yet if you take any greater number of seals than is taken now this ratio of cows to one bull would be greater, and for that reason there would be a less number of young seals, undoubtedly. I look upon the breeding of the seal as something like the breeding of any other animal, and that the same care and restriction and judgment should be exercised in this breeding.

1876–1880.

George Wardman (p. 39): Q. What is your impression of the number of seals that visit these rookeries annually?—A. I never could make it so much as Professor Elliott has done. I made many estimates. I have been to all the rookeries on these

islands many times, and compared them with the space occupied by the carcasses on the killing ground, and I feel pretty confident that the total number has been overestimated.

Q. He estimated it at something less than 4,000,000 on the two islands.—A. I think he estimates 250,000 to 275,000 on St. George. I have figured it out in several ways, and I think the 20,000 that we killed would be 10 per cent of the killable seals.

Q. Is that your estimate—10 per cent of all that come?—A. I take that for one thing. I take our killing ground, where we kill 20,000, and where we lay these seals along as close as we can, so as to give us greater area. We want to make room to take the next year another piece, so that by the third year we can go back again. I measured off that space two or three different times where 20,000 carcasses lay, and where I considered they lay as close as on the rookeries. I came to the conclusion we had about 40,000 at Zapadnie, 30,000 at Starry Arteel, and about 50,000 at North rookery, 10,000 to 15,000 on Little East rookery, and about 25,000 or 30,000 on East rookery. That is all the rookeries. I could never make it any more than that during that time. I measured the places carefully.[1]

Q. Do you put it at the same numbers annually?—A. About. I think the breeding seals on the rookeries come in about the same numbers; but the first year I was up there we killed 20,000 with great ease, and in a short time, and I considered that we could kill more easily; and I recommended Colonel Otis to make a bigger allowance for St. George, because we wanted to bring up our men's dividends a little. The next year he gave permission to take 25,000 on St. George, and they would take 75,000 on St. Paul. We got 21,000 or 22,000 that year. We had exceeded in our estimate the number that we could take at that time, and they had to finish our quota on the other island. Later in the season—perhaps two weeks after that—we could have got perhaps 10,000 more seals, but we certainly could not get them when we wanted them.

1887.

L. A. Noyes, per G. R. Tingle (p. 177). Measurements of breeding rookeries of St. George Island, by Dr. L. A. Noyes, acting assistant Treasury agent, January 4, March 1, and April 22, 1887.

Rookery.	Sea margin.	Depth.	Square feet.	Seals.
East	2,200	200	440,000	220,000
Zapadnie	2,100	160	336,000	168,000
Little Eastern	600	125	75,000	37,500
Starry Arteel	900	575	517,500	258,750
Near and North	3,500	300	1,050,000	525,000
Total	9,300	.....	2,418,500	1,209,250

The breeding grounds on St. George Island, surveyed July 12 and 15, 1873, gave the following figures (H. W. Elliott's "Condition of Affairs in Alaska, 1874," p. 78):

Rookery.	Sea margin.	Depth.	Square feet.	Seals.
Eastern	900	60	54,000	27,000
Little Eastern	750	40	30,000	15,000
North	2,000	25	50,000	25,000
Near	750	150	112,500	56,250
Starry Arteel	500	125	62,500	31,250
Zapadnie	600	60	36,000	18,000
Total	5,500	.....	345,000	172,500

1868–1888.

T. F. Morgan (p. 69). Q. Have you ever formed an estimate of the probable number of seals that visit the rookeries annually?—A. I have attempted to do it, but it is hard to do.

[1] Here he gives his figures, and after telling the committee that he can not make as many seals in counting as "Professor Elliott has done," yet he does do so, and more! His total for the St. George rookeries, as given by him, is 185,000 seals, against my sum total of 172,000.

Q. You are aware that Professor Elliott, in his book, estimates in the neighborhood of 4,000,000. What do you think about that estimate?—A. I think that Professor Elliott has overestimated it. When he was there the way he figured out the estimate was that he laid down the carcasses of seals and measured around them and then measured the rookeries.

Q. He estimated the average size of a harem?—A. Not only a harem, but every size of seal, each old bull. He measured the 4-year old, and the 3-year old, the 2-year old, and the 1-year old grown male, and then he took the extent of territory where the seal had laid and measured that, and computed his figures from the territory; but they do not lie all over the territory which he marked out.

Q. He measured all around, taking a given area?—A. The seals did not cover the whole area as thoroughly as he measured it. The only time he could make his measurement was after the seals had left. These were made then. You can not measure a rookery while the seals are lying there; but he observed the ground covered by the animals during the season and sketched out the details and where they were lying, and measured that after they had left there.[1]

Q. Do you think under careful treatment and the present policy a large number might be readily taken off after a year with safety?—A. Possibly; but I would not suggest that they should increase the catch very fast. I should go carefully and observe the effect, increasing at the rate of 5,000, 10,000, or 15,000.

1880–1885.

H. A. Glidden (p. 29). Q. What was your estimate of the value of those rookeries?—A. I could not estimate them. The seals are there by the millions; you can not count them.

1869–1872.

S. N. Buynitsky (p. 12). Q. Have you any means of making an estimate of the probable number of fur seals that visit these islands and rookeries?—A. I saw an approximate estimate made by Mr. Elliott. I do not know that I ever indulged in any figures as to that. I simply expressed my impression here [examining report]; no; I see I did not indulge in any guessing.

Q. You say that Professor Elliott has made some estimate of that?—A. Yes, sir; I say I did not make any estimate. I do not think any estimate would be within a million or two. I think he puts them at 5,000,000, but it may be 3,000,000 or 7,000,000, as they are countless. It is a sight never to be forgotten by one who saw it, and it recurs sometimes in my dreams—that vast extent of beach covered by these animals.

THE BEGINNING AND PROGRESS MADE IN DRIVING FROM THE UNDISTURBED HAULING GROUNDS OF ST. PAUL.

The statement made by the natives to Messrs. Goff, Murray, Nettleton, and myself, that no commercial driving was made from Zapadnie, West English Bay, Southwest Bay, Tonkie Mees, or from Polavina during the seasons of 1871–1874, and that it was not really begun in earnest until 1879,[2] is confirmed (independent of my own personal knowledge that no such driving was done during the seasons of 1872–1874) by the entries made in the Treasury agent's office journal, St. Paul village.

I made a careful examination last July of this, the only official record kept by the Government officers on either island of St. Paul or St. George. This journal on St. Paul is a large ledger-made book, which is opened there for the season of 1872, and continued without break from that time up to date of my examination. In this journal the Treasury agent in charge of the island makes a daily entry of the chief affairs of the day, i. e., the weather, doings of the natives in the village, and whites, employees of the lessees, etc.; arrival and departure of ships, steamers, etc.; and during the sealing season a daily record of the num-

[1] Mr. Morgan means well, but is painfully ignorant of my method of surveying the rookeries: See pages 21-24, *antea*.

[2] See p. 195, *antea*, Conference of natives with Government officers, etc.

ber of seal skins taken, together with a note of that place or places on the island where these skins were taken or driven from for that particular day's killing.

Extracting this record of the driving, as I have below for Polavina, involved a lengthy and patient reading of these rambling entries. To make sure that I overlooked nothing, I requested Mr. S. R. Nettleton, assistant Treasury agent, to make a similar examination and give me the dates. We agreed in our findings exactly as to Polavina; but the Zapadnie drives were so badly mixed up in this record after 1878, that it was not possible to make a truly accurate list, as in the case of Polavina.

But as Polavina was one of the several fine, large, hauling grounds, *never visited or driven from in 1872–1874, together with Zapadnie and Southwest Point*, this record of the driving there and its frequency in progression, etc, is valuable, independent of the testimony of the natives above referred to. With reference to this particular driving from Polavina, the natives, Artamanov and Booterin, in particular, claim to know that these drives, up to 1879, *were not taken from the Polavina hauling grounds back of that great rookery*, but *were gathered up anywhere between the old Polavina barrabkie and Tonkie Mees, or Stony Point*, and that *no driving from the great Polavina hauling plateau* and *Little Polavina up to Dalnoi was done* until the new salt house was built at Stony Point in 1879. These old native chiefs also averred that these early drives from those undisturbed reservoirs of 1872–1874 were made up exclusively of "big seals," i. e., smooth 4-year olds, or 11-pound skins.

The Treasury agent's official record of drives made from Polavina or Halfway Point.

[Extracted from the journal of the Treasury agent's office, St. Paul Village.]

1875:
June 16. *a*
1876:
June 14. *a*
1877:
June 13. *a*
22. *a*
26. *a*
1878:
June 24. *a*
July 1. *a*
1879:
June 10.
14.
16.
July 8.
1880:
June 21.
28.
July 5.
17.
1881:
June 10.
June 17.
24.
25.
July 2.
4.
7.
12.
13.
18.
1882:
June 16.
22.
30.
July 8.
1883:
June 6.
13.
20.
July 2.
12.
17.
1884:
June 18.
June 23.
July 7.
12.
14.
19.
1885:
June 15.
23.
26.
July 10.
16.
24.
1886:
June 9.
17.
23.
25.
30.
July 6.
12.
16.
21.
26.
1887:
June 16.
23.
30.
July 6.
14.
21.
1888:
June 15.
28.
July 7.
7.
14.
19.
24.
1889:
June 17.
25.
July 2.
10.
17.
24.
30.

Every one of these drives above noted made since 1879, embrace seals taken up from the entire region between Little Polavina down to Stony Point. The drive was finally rounded up and killed a short distance only from the Point, near the new salt house.

a Not taken from Polavina proper; someways south, including Stony Point.

Table showing the number of fur-seal skins taken from the Pribilov Islands since their transfer in 1867 from Russian to American ownership; also the tax, bonus, and rental paid.

Year.	Number of skins.	Tax, bonus, and rental paid.	Year.	Number of skins.	Tax, bonus, and rental paid.
1868	250,000	.....	1881	99,766	$316,984.75
1869 *a*	85,901	.....	1882	99,922	317,295.24
1870	9,577	$101,080.00	1883	75,000	251,875.00
1871	99,841	317,082.62½	1884	99,962	317,410.22½
1872	99,975	317,444.37½	1885	99,996	317,488.20
1873	99,744	316,927.00	1886	99,982	317,467.94
1874	99,998	317,494.75	1887	99,950	317,378.72½
1875	99,976	317,446.97½	1888	100,000	317,500.00
1876	89,964	291,155.50	1889	100,000	317,500.00
1877	75,526	253,255.75	1890 *b*	21,000	210,000.00
1878	99,980	317,461.39			
1879	99,962	317,410.22½	Total	2,206,057	6,208,916.17
1880	100,036	317,594.50			

a The skins of 1869 were called "food skins," and carried over to 1870, are added to the catch of that year, the beginning of the lease making a seeming return for this year of 95,477 skins taken in the first year of the Alaska Commercial Company's lease; tax, $2.02½ per skin taken, and rental of $55,000 per annum. As this lease did not go into operation until August, 1870, the Secretary made a rebate of some $22,000 rental.

b Lease of the Alaska Commercial Company expired May 1, 1890. Lease renewed to North American Commercial Company, allowed to kill 60,000, but secured only 21,000; tax, $9.62 for each skin taken, and $60,000 rental per annum.

NOTE.—The foregoing figures only account for those skins taken and shipped from the islands between 1870 and 1890; of those taken in 1868 no time list has been kept. Nearly 140,000 "food skins" have been taken between 1870 and 1890 which have never gone from the islands—were wasted and destroyed. This should never occur again. The 1869 skins paid a tax of only $1 per skin, and the rental for that year was only $5,480.75.

Table showing the beginning of each sealing season on the islands of St. Paul and St. George, from 1870 to 1890, inclusive, and the number of fur seals accepted by the lessees up to July 20 of each year.

[From the Treasury agent's record, St. Paul Island.]

Year.	St. Paul.		St. George.		Total skins accepted.
	Season began—	Skins accepted.	Season began—	Skins accepted.	
1870 *a*	.....	.....	.....	.....	.....
1871	June 1	29,788	June 4	12,604	42,392
1872	1	65,499	3	21,563	87,062
1873	3	68,035	4	17,362	85,397
1874	3	88,058	1	8,554	96,612
1875	1	83,890	1	10,000	93,890
1876	3	69,367	1	10,000	79,367
1877	4	58,732	1	15,000	73,732
1878	8	78,570	10	16,709	95,279
1879	2	80,572	3	20,569	*b* 101,141
1880	1	80,000	3	20,000	100,000
1881	6	80,000	9	20,000	100,000
1882	2	80,000	6	20,000	100,000
1883	4	60,101	4	11,123	71,224
1884	3	83,092	4	11,152	94,244
1885	3	70,451	1	15,000	85,451
1886	4	72,120	8	13,335	85,455
1887	1	77,389	9	13,381	90,770
1888	2	73,808	6	13,187	86,995
1889	1	68,485	4	10,138	78,623
1890	6	*c* 16,833	2	*c* 4,112	*c* 20,945

a No record.
b Accepted, but not shipped in one year; balance carried over.
c Taken by North American Commercial Company.

Table showing the amount of earnings received by the natives of St. Paul Island for taking and curing skins and the distribution of said earnings—the total number of fur-seal skins shipped from St. Paul Island by the Alaska Commercial Company from 1870 to 1889, inclusive.

[Report of Charles J. Goff, United States Treasury agent, July 31, 1890.]

Year.	Total fur-seal skins shipped.	Paid to natives for taking and curing skins.	Paid to natives for general labor.	Total fur seals killed.	Rejected stagy skins.
1870	6,017	$2,406.80	.....	6,017	.....
1871	76,134	30,853.60	$580.40	77,925	631
1872	74,941	30,416.00	221.97	76,698	1,[illegible]
1873	74,485	29,597.80	76.80	76,488	[illegible]
1874	89,924	29,849.60	217.53	97,932	[illegible]
1875	89,687	30,098.00	276.03	91,215	[illegible]
1876	80,000	31,848.20	113.40	79,199	1,[illegible]
1877	60,199	23,981.60	146.40	62,813	1,[illegible]
1878	82,000	32,654.00	a 2,218.38	83,034	[illegible]
1879	80,000	31,908.60	b 1,910.86	86,592	1,[illegible]
1880	80,000	31,889.00	215.40	80,276	[illegible]
1881 c	79,905	31,825.60	54.00	81,501	1,[illegible]
1882	80,000	31,750.80	250.50	81,420	1,[illegible]
1883	60,000	23,896.80	97.00	61,987	1,[illegible]
1884	85,000	33,785.60	240.00	86,013	[illegible]
1885	84,995	33,933.00	12.00	86,364	1,[illegible]
1886	85,000	33,941.80	134.00	85,689	[illegible]
1887	85,000	33,839.80	203.40	85,629	[illegible]
1888	85,000	33,834.60	15.60	85,271	[illegible]
1889	85,000	33,744.80	15.00	85,053	.....
Total	1,523,287	596,056.00	7,005.67	1,557,116	18,[illegible]

A GIFT DISTRIBUTION OF THESE NATIVES' EARNINGS ANNUALLY MADE BY THEMSELVES.

Year.	Received by St. Paul church.	Received by St. Paul priest.	Received by St. Paul widows.	Received by St. Paul aged and sick.	Received by St. Paul church for translation of church service.	Received by chiefs as salary.	Received by Oonalashka church.	Received by Oonalashka priest.
1870	$150.00	.....	$77.20	.....	.....	.....	.....	$109.30
1871	910.16	.....	614.82	.....	.....	.....	.....	d 455.08
1872	902.45	$451.22	.....	.....	.....	.....	.....	.....
1873	870.62	435.11	.....	.....	.....	.....	.....	.....
1874	859.06	429.53	.....	.....	.....	.....	.....	.....
1875	432.07	432.07	.....	.....	.....	.....	$432.07	.....
1876	757.12	.....	.....	.....	.....	.....	378.40	756.80
1877	621.50	621.48	.....	.....	.....	.....	310.74	.....
1878	855.78	855.78	500.00	.....	.....	$300.00	.....	855.78
1879	822.24	821.50	200.00	.....	.....	450.00	450.00	.....
1880	813.10	813.10	150.05	$200.00	$1,219.65	450.00	.....	.....
1881 c	857.66	857.66	.....	.....	428.83	225.00	.....	.....
1882	.....	1,000.00	2,650.00	.....	.....	.....	.....	.....
1883	.....	750.00	50.00	.....	.....	225.00	.....	.....
1884	.....	1,000.00	300.00	.....	.....	300.00	.....	.....
1885	.....	1,000.00	.....	1,000.00	.....	300.00	.....	.....
1886	.....	1,000.00	200.00	600.00	.....	200.00	.....	.....
1887	.....	1,000.00	1,500.00	.....	.....	200.00	.....	.....
1888	.....	1,000.00	150.00	.....	.....	200.00	.....	.....
1889	.....	1,000.00	2,500.00	.....	.....	200.00	.....	.....
Total	d 8,851.76	d 13,467.45	d 8,892.07	d 1,800.00	d 4,648.48	3,050.00	d 1,571.21	d 2,176.96

a One thousand twenty-two dollars and ninety-two cents received by natives for making oil, under head of general labor.

b One thousand six hundred and sixty-six dollars and six cents received by natives for making oil, under head of general labor.

c Fifty dollars received by school teacher.

d Four hundred and fifty-five dollars and eight cents received by Dr. Kramer; first-class share.

Summary showing the total number of fur seals killed for skins on the islands of St. Paul and St. George by the Alaska Commercial Company from 1870 to 1889, inclusive; also the number of large young seals and pups killed for natives' food on the islands of St. Paul and St. George from 1870 to 1889, inclusive; the total number of fur-seal skins shipped from St. Paul and St. George islands by the Alaska Commercial Company from 1870 to 1889, inclusive; the amount of earnings received by the natives of St. Paul and St. George for taking and curing skins and the distribution of said earnings.

Fur seals killed for skins on the islands of St. Paul and St. George by the Alaska Commercial Company, and also for natives' food, from 1870 to 1889, inclusive	1,877,030
Fur-seal skins shipped from St. Paul and St. George by the Alaska Commercial Company from 1870 to 1889, inclusive	1,840,364
Fur seals rejected as stagy at St. Paul and St. George from 1870 to 1889, inclusive	20,393
Fur seals destroyed on St. Paul and St. George in securing catch from 1870 to 1889, inclusive	16,273
Total	1,877,030
Earnings received by natives of St. Paul and St. George from 1870 to 1889, inclusive	$755,672.87
Donations by natives of St. Paul and St. George from 1870 to 1889, inclusive	50,608.11
Paid to chiefs on St. Paul Island (St. George is included in donations)	3,050.00
Paid to St. George men for work done on St. Paul Island	25,780.40
Paid to Kodiak men for work done on St. Paul Island	680.00
Unaccounted for	19.25
Paid to school teacher	50.00
Expended by the natives of St. Paul and St. George from 1870 to 1889, inclusive	643,963.10
Balance due to natives May 24, 1890, now held by the North American Commercial Company	28,117.02
Balance held by Alaska Commercial Company for Mrs. Melevidoff	3,404.99
	755,672.87
Fur-seal pups (five months old) killed for natives' food on— St. Paul and St. George islands from 1870 to 1889, inclusive, *total*	92,864
(Proportioned between the islands as follows)—	
St. Paul Island from 1870 to 1889, inclusive	63,804
St. George Island from 1870 to 1889, inclusive	29,060
	92,864

(Report of Charles J. Goff, United States Treasury agent, July 31, 1890.)

Daily statement of fur seals killed on St. Paul Island, Alaska, during the sealing season ending July 20, 1890.

Date.	Rookery.	Number of seals killed for natives' food.				Number of seals killed by lessees for skins.					Aggregate.		
		Large young seals.	Skins accepted by lessees.	Skins rejected.		Accepted.		Rejected.			Skins accepted.	Skins rejected.	Total seals killed.
				Under size.	Cut.	Prime.	Second class.	Under size.	Cut.	Total.			
1890.													
May 28	Southwest Bay	119	115	3	1	115	...	...	1	5	115	4	119
June 6	Reef	...	...	...	...	115	...	...	1	1	115	1	116
11	.....do	...	...	...	...	539	...	35	...	35	539	35	574
13	Tolstoi	...	...	...	...	181	1	...	...	...	182	...	182
16	Reef	...	...	...	...	315	...	1	1	2	315	2	317
17	Northeast Point	...	...	...	...	16	...	...	...	...	16	...	16
17	Halfway Point	...	...	...	...	167	...	...	...	...	167	...	167
18	Tolstoi and Middle Hill	...	...	...	...	270	...	...	4	4	270	4	274
18	Northeast Point	...	...	...	...	78	...	...	...	...	78	...	78
20	Reef and Lukannon	...	...	...	...	339	...	...	...	...	339	...	339
20	Northeast Point	...	...	...	...	438	...	...	...	...	438	...	438
21	Southwest Bay	...	...	...	...	290	...	...	2	2	290	2	292
21	Northeast Point	...	...	...	...	96	...	...	...	...	96	...	96
23	English Bay and Lukannon	...	...	...	...	515	3	...	3	3	518	3	521
23	Northeast Point	...	...	...	...	176	2	1	...	1	178	1	179
24	Reefs and Zoltoi	...	...	...	...	414	...	10	2	12	414	12	426
24	Northeast Point	...	...	...	...	202	3	...	...	...	205	...	205
25	Halfway Point	...	...	...	...	263	...	3	...	3	263	3	266
25	Northeast Point	...	...	...	...	164	2	...	...	...	166	...	166
26	Southwest Bay	...	...	...	...	114	2	...	1	1	116	1	117
27	English Bay and Middle Hill	...	...	...	...	374	2	19	1	20	376	20	396
27	Northeast Point	...	...	...	...	225	5	...	...	...	230	...	230
28	Reef	...	...	...	...	205	1	...	...	...	206	...	206
28	Northeast Point	...	...	...	...	79	...	...	...	...	79	...	79
30	Tolstoi, English Bay, Middle Hill, and Ketavie	...	...	...	...	206	1	2	...	2	207	2	209
30	Northeast Point	...	...	...	...	97	1	...	...	...	98	...	98
July 1	Reef	...	...	...	...	246	...	...	...	...	246	...	246
1	Northeast Point	...	...	...	...	130	1	...	...	...	131	...	131
2	Halfway Point	...	...	...	...	240	...	...	2	2	240	2	242
2	Northeast Point	...	...	...	...	96	...	...	...	...	96	...	96
3	Southwest Bay	...	...	...	...	181	...	2	...	2	181	2	183
3	Northeast Point	...	...	...	...	180	...	...	...	...	180	...	180
4	Tolstoi, English Bay, and Middle Hill	...	...	...	...	472	...	19	3	22	472	22	494
4	Northeast Point	...	...	...	...	318	3	...	...	...	321	...	321
5	Reef	...	...	...	...	524	1	...	1	1	525	1	526
5	Northeast Point	...	...	...	...	74	...	...	...	...	74	...	74
7	English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie	...	...	...	...	400	...	11	...	11	400	11	411
7	.....do	...	...	...	...	400	...	11	...	11	400	11	411
7	Northeast Point	...	...	...	...	336	...	...	...	...	336	...	336
8	Halfway Point	...	...	...	...	257	...	3	1	4	257	4	261
8	Northeast Point	...	...	...	...	378	1	...	...	...	379	...	379
9	Southwest Bay	...	...	...	...	160	2	1	...	1	162	1	163
9	Northeast Point	...	...	...	...	271	...	...	...	...	271	...	271
10	Reef	...	...	...	...	373	1	2	2	4	374	4	378
10	Northeast Point	...	...	...	...	112	...	...	...	...	112	...	112
12	English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie	...	...	...	...	624	5	4	...	4	629	4	633
13	Halfway Point	...	...	...	...	211	...	...	...	...	211	...	211
13	Northeast Point	...	...	...	...	641	...	...	17	17	641	17	658
14	Reef	...	...	...	...	104	...	...	...	...	104	...	104
15	English Bay, Middle Hill, Tolstoi, Lukannon, and Ketavie	...	...	...	...	315	...	...	...	...	315	...	315
15	Northeast Point	...	...	...	...	245	...	...	...	...	245	...	245
16	.....do	...	...	...	...	311	...	1	...	1	311	1	312
17	Polavina, Lukannon, and Ketavie	...	...	...	...	369	3	...	...	...	372	...	372
17	Northeast Point	...	...	...	...	485	...	...	...	...	485	...	485
18	.....do	...	...	...	...	405	...	...	...	...	405	...	405
18	Zapadnie	...	...	...	...	80	...	...	...	156	80	156	236

Daily statement of fur seals killed on St. Paul Island, Alaska, during the sealing season ending July 20, 1890—Continued.

Date.	Rookery.	Number of seals killed for natives' food.				Number of seals killed by lessees for skins.					Aggregate.		
		Large young seals.	Skins accepted by lessees.	Skins rejected.		Accepted.		Rejected.			Skins accepted.	Skins rejected.	Total seals killed.
				Under size.	Cut.	Prime.	Second class.	Under size.	Cut.	Total.			
1890.													
19	Reef and Zoltoi	....	....	....	....	547	2	3	4	7	549	7	556
19	Northeast Point	....	....	....	....	446	....	....	....	....	446	....	446
20	English Bay, Middle Hill, Tolstoi, Lukannon, Ketavie, and Point Rocky	....	....	....	....	752	6	18	4	....	758	22	780
20	Northeast Point	....	....	....	....	507	2	47	....	....	509	47	556
	Total	119	115	3	1	16,783	50	185	50	344	16,833	391	17,724

CHAS. J. GOFF,
United States Treasury Agent in Charge.

Daily statement of fur seals killed on St. George Island, Alaska, during the sealing season ending July 20, 1890.

Date.	Rookery.	Number of seals killed by lessees for skins.				Aggregate.		
		Accepted.		Rejected for other reasons—died on the road.	Total.	Skins accepted.	Skins rejected.	Total seals killed.
		Prime.	Second class.					
1890.								
June 2	North	71	.....	.....	71	71	.....	71
16	East	214	4	.....	218	218	.....	218
18	North	113	4	.....	118	117	1	118
19	East and Little East	179	2	.....	181	181	.....	181
20	Zapadnie	394	.....	.....	394	394	.....	394
23	Starry Arteel and North	162	2	.....	164	164	.....	164
25	East and Little East	182	2	.....	184	184	.....	184
28	Starry Arteel and North	188	1	.....	189	189	.....	189
30	Zapadnie	189	.....	.....	189	189	.....	189
July 1	East and Little East	145	.....	4	149	145	4	149
3	Starry Arteel and North	234	.....	4	238	234	4	238
5	East and Little East	56	1	.....	57	57	.....	57
7	Zapadnie	57	.....	1	58	57	1	58
8	East and Little East	23	.....	1	24	23	1	24
9	Starry Arteel and North	183	3	7	193	186	7	193
11	East	59	.....	1	60	59	1	60
12	Starry Arteel and North	102	.....	1	103	102	1	103
14	Zapadnie	53	.....	.....	53	53	.....	53
15	East	131	.....	1	132	131	1	132
16	Starry Arteel and North	119	.....	.....	119	119	.....	119
18	East	71	.....	.....	71	71	.....	71
20	Starry Arteel and North	634	7	.....	641	641	.....	641
20	Zapadnie	527	.....	.....	527	527	.....	527
	Total	4,086	.....	21	4,133	4,112	21	4,133

NOTE.—One rejected skin was given to the chief and the remaining (20) were salted down in the salt house till further orders.

JOSEPH MURRAY,
First Assistant Agent, Treasury Department.

Daily comparison of the killing of fur seals on the island of St. Paul, seasons of 1889 and 1890.

[From report July 31, 1890, of Charles J. Goff, United States Treasury agent in charge.]

VILLAGE.

Date.	Number killed.	Date.	Number killed.
1889.		1890.	
June 5	201	June 6	116
10	120	11	574
12	947	13	182
14	762	16	317
15	340	17	167
17	895	18	274
18	1,161	20	339
19	1,561	21	292
20	253	23	521
22	1,353	24	426
24	2,578	25	266
25	979	26	117
26	1,314	27	396
27	311	28	206
28	1,349	30	209
29	1,038		
Total	15,162	Total	4,462
July 1	1,023	July 1	246
2	834	2	242
3	1,841	3	183
4	1,716	4	494
5	1,255	5	536
6	1,302	7	411
8	814	8	261
9	1,314	9	163
10	654	10	378
12	2,004	12	633
13	1,006	13	211
15	3,085	14	104
16	1,911	15	315
17	1,931	17	372
18	2,046	18	236
19	2,017	19	556
20	1,913	20	780
Total	6,666	Total	6,111

NORTHEAST POINT.

Date.	Number killed.	Date.	Number killed.
1889.		1890.	
June 17	1,054	June 17	16
18	1,270	18	78
19	494	20	438
21	1,205	21	96
24	754	23	179
25	1,407	24	205
26	441	25	166
27	844	27	230
28	479	28	79
29	355	30	98
July 1	1,200	July 1	131
2	968	2	86
4	1,559	3	180
5	1,524	4	321
6	376	5	74
8	914	7	336
9	641	8	379
10	800	9	271
13	793	10	112
15	1,838	13	658
16	1,156	15	245
17	948	16	312
18	1,282	17	485
19	834	18	495
20 *a*	243	19	446
		20	556
Total	15,076	Total	5,007

a Two hundred and forty-three this day to make the full quota of 100,000.

AUTHENTIC STATEMENT OF VALUE OF SEALING PLANT ON THE PRIBILOV ISLANDS.

Items of the summary of the cash settlement made by the Alaska Commercial Company with the North American Commercial Company, signed and dated on St. Paul Island, Pribilov Group, May 24, 1890, in accordance with a mutual agreement made March 12, 1890, at Washington, D. C., in the United States Treasury Department, by which the full transfer of the entire sealing plant of the old lessees to the undivided possession of the new lessees was amicably effected.

* * * * * * *

The Alaska Commercial Company was represented by Mr. Neumann, and the North American Commercial Company by Mr. Tingle, and I acted as umpire, as per your instructions, bearing date the 16th April, 1890. We arrived at St. Paul Island on the 21st May, and immediately commenced to take stock. After several days' labor the business was well in hand, and we proceeded to St. George Island, per steamer *Dora*, and made a complete inspection and inventory of all the property there belonging to the Alaska Commercial Company. After our return to St. Paul there was one difference referred to me, and satisfactorily adjusted; then the entire business was settled by the representatives of their respective companies.

(*Report of Charles J. Goff, United States Treasury agent, July 31, 1890.*)

(Copy of the duplicate copy of original summary.)

Recapitulation of merchandise and property transferred by the Alaska Commercial Company to the North American Commercial Company, in accordance with the agreement of March 12, 1890.

At St. Paul Island:		
Merchandise	$14,180.61	
Cash	939.90	
Tools and implements	2,008.79	
Household furniture	3,098.27	
School books, desks, and bells	257.00	
Boats, bidarrahs, and steam launch	2,570.00	
Live stock	1,395.00	
Buildings, improvements, and telephone	40,855.00	
		$65,304.57
At St. George Island:		
Merchandise	7,909.68	
Cash	941.50	
Tools and implements	505.84	
Household furniture	1,007.12	
Boats and bidarrahs	750.00	
Live stock	562.00	
Buildings and improvements	14,255.00	
		25,931.14
Grand total		91,235.71

LIABILITIES.

Due to natives and others at St. Paul	11,733.70	
Bank account of natives	12,123.93	
Due natives and others at St. George	6,979.54	
		30,837.17
Net balance due Alaska Commercial Company		60,398.54

[SEAL.] RUDOLPH NEUMANN,
[SEAL.] GEO. R. TINGLE,
[SEAL.] CHARLES J. GOFF,
Arbitrators.

The above cash settlement shows that the entire sealing plant of the Alaska Commercial Company, such as buildings, tools, live stock, boats, household furniture, and improvements, was sold to the new lessees for $67,264.02. This was its full cash value.

The transfer, as above stated, of merchandise and cash represented no cost to the new lessees, since the former was native store goods: was all salable, and was soon resold to the natives for a slight advance over the figures given above. The cash is that coin (silver dollars and half dollars chiefly) which is kept in circulation by the company among the people, plus their credit books at the village stores.

Table showing the number of fur-seal skins taken from the Russian hauling grounds on the Commander Islands, Bering Sea, since 1871 and shipped to the markets.[1]

Year.	Robbens Island.	Bering and Copper islands.	Total.	Year.	Robbens Island.	Bering and Copper islands.	Total.
1871	.....	3,614	3,614	1882	4,106	40,514	44,620
1872	.....	29,356	29,356	1883	2,049	26,650	28,699
1873	2,694	27,710	30,404	1884	3,819	50,034	53,853
1874	2,414	28,886	31,300	1885	1,838	41,737	43,575
1875	3,127	33,152	36,279	1886	.....	54,591	54,591
1876	1,528	25,432	26,960	1887	.....	46,347	46,347
1877	2,949	18,584	21,533	1888	.....	47,362	47,362
1878	3,142	28,198	31,340	1889	.....	52,755	52,755
1879	4,002	38,748	42,750	1890	.....	52,502	52,502
1880	3,330	45,174	48,504				
1881	4,207	39,314	43,521	Total	.....	.....	769,863

[1] Bering and Copper islands constitute what is known as the Commander group. Robbens Reef or Island is a small islet, or rock, rather, about 30 miles off shore from the east shore of Sakhalen Island, in the Okotak Sea; it belongs to Russia also. These skins were all taken under the lease to Hutchinson, Kohl Philippaeus & Co., and paid a tax of $1.50 to the Imperial treasury for each skin taken. This lease expired in November, 1890, and at the date of this report it is not known definitely as to its renewal.

Under Russian management the yield from these islands I have the record of, as follows:

1862	4,000	1865	4,000	1868	12,000
1863	4,500	1866	4,000	1869	24,000
1864	5,000	1867	4,000	1870	24,000

No account of the proportion that Robbens Reef gives to this total for each year between 1862 and 1870 has been found by the writer.

THE PELAGIC CATCH FROM 1886 TO DATE.

[With the year 1886 this work of hunting fur seals in the open waters of the ocean by white men, outfitting vessels, and hiring hunters, practically begins: it is the first year that the British hunters ever got into Bering Sea.]

Table showing the number of fur-seal skins taken by the pelagic sealers and poachers in the North Pacific Ocean and Bering Sea.

	Skins.
Pelagic and poaching catch of 1886:	
Landed at Victoria, British Columbia, by British sealers	25,538
Landed at Victoria, British Columbia, by American sealers	5,000
Landed at San Francisco, Cal., by American sealers	2,944
Seized in Bering Sea by the United States Revenue-Marine cutter *Rush*	2,177
Total	35,659
Pelagic and poaching catch of 1887:	
Landed at Victoria, British Columbia, by British sealers	17,078
Landed at Victoria, British Columbia, by American sealers	2,536
Landed at San Francisco, Cal., by American sealers	6,502
Seized in Bering Sea by cutters *Rush* and *Bear*	12,345
Total	38,461

Pelagic and poaching catch of 1888:	
Landed at Victoria, British Columbia, by British sealers	19,011
Landed at San Francisco, Cal., by American sealers	5,348
Total	24,359
Pelagic and poaching catch of 1889:	
Landed at Victoria, British Columbia, by British and American sealers	39,538
Landed at San Francisco, Cal., by American sealers	1,800
Seized in Bering Sea by cutters *Bear* and *Rush*	2,531
Total	43,869
Pelagic and poaching catch of 1890:	
Landed at Victoria, British Columbia, by British and American sealers	38,404
Landed at San Francisco, Cal., by American sealers	7,228
Total	45,632

Only in a general way, at this writing, can the relative number of skins taken in Bering Sea be declared as distinct from the North Pacific catch. In 1886 the Bering Sea catch can be said to be very near 20,000; in 1887, 29,000; in 1888, 19,000 (no seizures were made that year); in 1889, 25,500; in 1890, 16,000 (no seizures).

The short supply, together with the threatened extermination of the fur seal, made the London sale a very lively one last October. The following citation from the New York Fur Trade Review for December, 1890, is interesting:

OCTOBER SALES.

[Report by Messrs. Blatspiel, Stamp & Heacock.]

The sales covered six days and comprised a larger variety of furs than previously offered in the autumn. Of course the chief item has been salted fur seals, sold on the 27th instant, and the various catalogues have contained 20,994 Alaska, 42,721 Copper Island, 20,117 Northwest Coast, 9,649 Lobos, and 1,873 Cape of Good Hope, etc., making a total of only 95,354 (as against 126,217 last year), and this total was only brought together now by including the larger part of the catch from Copper Island, which were heretofore always sold in the following spring. The attendance for the seal sale was large, but for the other furs there was a smaller number of buyers from Germany present than last year, and buyers generally were not eager.

As soon as the small catch of Alaska by the new company became known early in September, the fur-seal market became excited and values speedily advanced. It was mentioned that the herds on the seal islands had been greatly diminished by the indiscriminate slaughter of females on the open seas, and therefore the catch for next year on the Pribilov Islands could not now be forecast; it might again have to be very small.

The quality of the 20,994 Alaska was excellent and chiefly large sizes, the great number of small skins which we have had the past few years being conspicuously absent. Of course, for the Alaska the demand was far greater than the supply, and consequently prices advanced rapidly and greatly, averaging about 90 per cent all round. Separated, the ratio of advance was: On 659 middlings and smalls, 75 per cent; on 2,939 smalls, 65 per cent; 5,144 large pups, 85 per cent; 7,684 middling pups, 100 per cent; 3,752 small pups, 130 per cent, and 71 extra small pups, 100 per cent. There were exceptionally few (745) low and cut skins, which were also in good demand. Nearly all were secured for America.

The 42,721 Copper Island skins were also of somewhat superior quality, but having already somewhat improved last March, they now sold at an average advance of fully 50 per cent, being nearly level in advance in all the sizes; these were also largely secured for America, but part were taken by European dealers and furriers.

The Northwest Coast skins were of average fair quality, and ranging lower in prices, were more appreciated by the English trade; the advance, however, proved about 60 per cent on rates current last spring.

The Lobos, although the quality was on the whole nothing choice of the sort, ranged nearly 50 per cent dearer than last year. The small low skins hardly advanced in the same ratio; many were taken for France.

The Cape of Good Hope also participated in the general advance.

Suggestions for the new rules that should be adopted and enforced by the Secretary of the Treasury for the land killing, in lieu of the existing order and conduct of affairs, whenever said land killing is again permitted by the Government.

REVISED REGULATIONS FOR THE DRIVING AND KILLING OF MALE FUR SEALS ON THE PRIBILOV ISLANDS OF ALASKA.

1. No herd of male or killable fur seals shall be driven over a greater distance than one-half mile from the hauling ground upon which it is found and from which it is taken by the drivers.

2. At a distance of a half mile from the borders of the several hauling grounds of the killable fur seals on the Pribylov Islands, and well back from the sea margin, killing grounds shall be established; so that each and every locality known on the islands of St. Paul and St. George (of the Pribylov group) as a hauling ground shall have its own slaughtering field, and upon which all seals killed for tax and shipment, driven from said localities, must be killed and skinned.

3. All male fur seals that are driven in these herds up to these killing grounds from the hauling grounds adjacent, as above specified in regulations 1 and 2, shall be killed without culling out any save those which are under 1 year of age, known as "short yearlings," and over 4 years of age, known as "wigs." These two classes, under and over age, may be culled out and rejected, and those only.

These regulations, when enforced, will prevent any injury from redriving and culling the herds. Their language is too plain for any Government agent to fail to understand, and their evasion is only possible by the collusion of everybody on the islands—natives, officials, and employees of the lessees—a fairly improbable event, and one that can not take place without swift detection, even if such collusion were undertaken.

The topography of the islands makes the location of these killing grounds, as above ordered, entirely practicable and proper.

REPORT

ON

EDUCATION IN ALASKA, 1885–1895.

BY

SHELDON JACKSON,
General Agent of Education for Alaska.

DECENNIAL REVIEW OF EDUCATION IN ALASKA, 1885-1895.

By SHELDON JACKSON, *General Agent of Education for Alaska.*

[From the Annual Report of the Commissioner of Education, 1894-95, pp. 1442-1455.]

As the present year closes ten years of education in Alaska by the United States Government, it seems an appropriate occasion for recalling the history of the past. Information concerning education under the Russian Government is very meager, the only available sources to the English reader being the admirable work of William H. Dall, Alaska and its Resources (pp. 351 and 352), and the annual reports of the Bureau of Education.

The first European settlers were Russians, attracted by the valuable furs and skins. Many of these married Indian women and raised families of mixed blood or creoles. As these children increased in number and grew up there began to be on the part of some of the fathers a felt need for schools. Accordingly Gregory Shelikoff, governor of the colony and founder of the Russian-American Fur Company, established a school at Kadiak about the year 1792, which was taught by the trader. In 1793 Catherine II, Empress of Russia, through a ukase ordered missionaries to be sent to her North American colony. In accordance with this order, the following year 11 monks sailed from Ochotsk for Kadiak Island in charge of Archimandrite Josasaph, an elder in the order of Augustine Friars, who were expected to take charge of schools as well as churches. In 1805 the Imperial chamberlain and commissioner, Count Nikolai Resanoff, organized a school at Kadiak under the name of the "House of Benevolence of the Empress Maria," in which were taught the Russian language, arithmetic, and the Greek religion. In 1805 a school was opened at Sitka. It held a very precarious existence, however, until 1820, when it came under the charge of a naval officer, who kept a good school for thirteen years. In 1833 this school came under the direction of Etolin, who still further increased its efficiency. Etolin was a creole, who by force of ability and merit, raised himself to the highest position in the country, that of chief director of the fur company and governor of the colony. He was a Lutheran, the patron of schools and churches. While governor he erected a Protestant church at Sitka and presented it with a small pipe organ, which is still in use.

In 1840, besides the colonial school at Sitka, was one for orphan boys and sons of workmen and subaltern employees of the fur company, in which were taught reading, writing, arithmetic, grammar, mechanical trades, and religion. In 1839 a girls' school of a similar character was established and the number of boarders limited to 40. In 1841 a theological school was established at Sitka, which, in 1849, was advanced to the grade of a seminary. This made 5 schools at Sitka—2 for the

children of the lower class, 2 for the higher class, and 1 seminary. About the time of the transfer of the country the teachers were recalled to Russia and the schools suspended.

But with the change of government came a new people. The majority of the Russians left the country and their places were taken by Americans. Many came in from California, and on the 8th of November, 1867, less than a month from the time that the country passed under the United States flag, the citizens called a meeting and formed a temporary local government, and on the 18th of December, 1867, a petition, formed by 49 persons, 2 of whom "made their mark," was presented to the common council, asking that a citizens' meeting might be called to empower the council to establish a school. On the 20th of March, 1868, the council adopted some school regulations and appointed three trustees, who exercised a joint control with a committee of officers from the military post at Sitka. During the winter of 1868–69 a school building was purchased. The annual reports of the trustees have disappeared, and there is nothing to show the time when teaching commenced. In October, 1869, the council voted that the salary of the teacher should be $75 per month in coin, and on March 1, 1871, it was ordered to be $25 per month, which evidently means that at the latter period the post commander withdrew the $50 per month which had been paid from the army funds. On the 12th of August, 1871, permission was given the bishop of the Greek Church to teach the Russian language one hour each day in the public school. During 1873 the school seems to have died out.

In 1879 and 1880 an attempt was made to establish a school for Russian children, which was taught by Mr. Alonzo E. Austin and Miss Etta Austin. In the winter of 1877 and 1878 Rev. John G. Brady was appointed to Sitka, and in April, 1878, a school was opened by Mr. Brady and Miss Fanny E. Kellogg. In December, through a combination of circumstances, it was discontinued. In the spring of 1880 Miss Olinda Austin was sent out by the Presbyterian Board of Home Missions from New York City, and commenced school April 5 in one of the guardhouses, with 103 children present. This number increased to 130. Then some of the parents applied for admission, but could not be received, as the room would not accommodate any more.

In November some of the boys applied to the teacher for permission to live in the schoolhouse. At home, they alleged, there was so much drinking, talking, and carousing that they could not study. The teacher replied that she had no accommodations, bedding, or food for them. But they were so much in earnest that they said they would provide for themselves. Upon receiving permission, seven native boys, 13 and 14 years of age, bringing a blanket each, voluntarily left their homes and took up their abode in a vacant room of one of the Government buildings. Thus commenced the boarding department of the Sitka school. Soon other boys joined them. Capt. Henry Glass, who succeeded Captain Beardslee in the command of the U. S. S. *Jamestown*, from the first, with his officers, especially Lieut. F. M. Symonds, U. S. N., took a deep interest in the school. As he had opportunity he secured boys from distant tribes and placed them in the institution, until there were 27 boys in the boarding department.

In the winter of 1882 the schoolhouse was burned, and the boys took refuge in an abandoned Government stable, which was fitted up for them. In the fall of 1882, after consultation with the collector of customs, the commander of the United States man-of-war, and the leading citizens, I selected a new location for the school outside of village limits

and erected a 2½-story building, 100 by 50 feet in size. This location was donated to the Board of Home Missions by the Rev. John G. Brady.

In 1869 Mr. Vincent Collier, secretary of the Board of Indian Commissioners, paid a visit to the native tribes along the southern coast of Alaska, and upon his return to Washington made a report of his journey, among other things recommending an appropriation of $100,000 to provide schools of instruction in the primary branches of the English language for the natives of Alaska. The report was indorsed by the Hon. J. D. Cox, Secretary of the Interior, and on April 22, 1870, transmitted to the Hon. James Harlan, chairman of the Committee on Indian Affairs, United States Senate. In the bill before Congress making appropriation for the Indian Department, etc., for 1870–71, a proviso was added for the support of industrial and other schools among the Indian tribes not otherwise provided for, to be expended under the direction of the Secretary of the Interior, $100,000. The Indian Peace Commission had recommended a specific appropriation for the Indians in Alaska, as also had the Secretary of the Interior. Congress preferred to make the appropriation general, leaving it to the Secretary to apply such part to the Alaskan Indians as in his discretion he might think best.

On the 16th of March, 1870, the Hon. John Eaton, Ph. D., LL. D., was appointed United States Commissioner of Education. From the very first he took a special and deep interest in trying to secure education in Alaska; and in his first Annual Report (1870), pages 336, 337, and 345, he makes a plea for the establishment of schools in Alaska. Again in his Annual Report for 1871 (p. 404) he calls attention to the appropriation of $100,000 previously mentioned, and states the fact that nothing had been done with it so far as pertained to education in Alaska, and closes with this paragraph:

> At the last session of the Forty-first Congress an appropriation of $100,000 was made for "industrial and other schools among the Indian tribes not otherwise provided for." This amount was recommended by the Board of Indian Commissioners, with the expectation that a considerable proportion would be used in establishing free schools among the Alaska and Aleutian Indians. It does not appear that any steps have been taken for that purpose, the money being expended among other tribes. No effort has so far been made to educate these Indians, estimated as numbering more than 70,000 souls. The discovery of gold induces the migration of whites. The few trading operations are also gathering a large force of employees. There is great need of some practicable educational work in this Territory.

In his Annual Report for 1872 (pp. 20, 21), he again calls attention to the neglected condition of Alaska, saying:

> Alaska lies entirely outside of all organized efforts for education, and presents the singular fact of being an integral part of the boasted most progressive nation in the world, and yet without the least possible provision to save its children from growing up in the grossest ignorance and barbarism. No report has been received by the office from the two schools which the Fur-Seal Company is bound by its contract to support among the Aleutians.

In his Report for 1873 (p. 424), he publishes a letter from Capt. Charles Bryant, agent for the United States Treasury Department, giving information of the two schools upon the Pribilof Islands, which the Alaska Commercial Company, in virtue of its lease with the Treasury Department, is under obligation to maintain during eight months in each year of the lease, commencing with May 1, 1870. In the Annual Report for 1875 (p. 463), he publishes a long letter from William H. Dall with regard to the need of educational privileges in Alaska. In the Annual Report for 1877 (p. 3, xl), he publishes a long report from Sheldon Jackson, superintendent of Presbyterian missions in Alaska, giving an account of the commencement of schools by the Home Missionary

Society of the Presbyterian Church of the United States of America. In the Annual Report for 1878 (pp. 2, xvii and 266), he gives a second report of Sheldon Jackson upon the progress of the Presbyterian schools in southeast Alaska; also, the character and customs of the native population. In the Annual Report for 1879 (p. 264), he publishes the third report of Mr. Jackson. In the Annual Report for 1880 (pp. liv and 350), occurs another report of Mr. Jackson on the progress of the Presbyterian schools. Also the Annual Report of Education for 1881 (pp. lxxviii and 286).

This brings us to the commencement of organized education by the United States Government. The securing of action during all these years it will be noticed the deep interest taken by Dr. John Eaton, Commissioner of Education, and when, in the year 1877, I came to Washington to try and influence Congress to make provision for education in Alaska I received a warm welcome from the Commissioner and every facility and encouragement that it was in his power to render. I found in the general public very great indifference with regard to Alaska. The prevailing opinion was that there was nothing in that distant section worth the attention of the national Congress. The struggle to awaken a public interest throughout the country and through that influence to secure action by Congress was a long and tedious one.

In the winter of 1877–78 I visited many of the leading cities of the country from Boston to Chicago and St. Louis, making addresses upon the condition of Alaska; also as I had opportunity wrote articles on the subject for the public press. These addresses and articles were repeated again in the winters of 1878, 1879, 1880, 1881, 1882, and 1883.

On December 10, 1877, at my suggestion the Revs. Dr. Henry Kendall and Cyrus Dickson, secretaries of the Board of Home Missions of the Presbyterian Church, addressed a letter to the honorable Secretary of the Interior, asking for Government aid for education in Alaska. In the spring of 1879 Hon. Carl Schurz, Secretary of the Interior, called upon Dr. Henry Kendall and Dr. Sheldon Jackson, who were about to visit Alaska, for a report upon the condition of the natives of Alaska, which report was sent to the Secretary of the Interior October 15, 1879. In reply the honorable Secretary of the Interior suggested the enlargement or increase of former efforts in the way of holding conventions throughout the country and rousing public sentiment. This suggestion was adopted, with the result that petitions and memorials commenced pouring in upon Congress. In January, 1880, Hon. James A. Garfield presented a series of these memorials[1] in the House of Representatives,

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[1] Whereas the United States is responsible for the proper care and government of Alaska, the native inhabitants of which and creoles of mixed blood are docile, peaceful, partially civilized, apt in the mechanical arts, and anxious for instruction; and

Whereas it is believed to be the wise policy as well as duty of the Government to adopt prompt measures for their education, with a view to their admission to the rights of citizenship; and

Whereas it is both cheaper and more humane to give them educational facilities now than to fight them hereafter at a largely increased cost; and

Whereas they are a self-supporting people, needing no annuities, clothing, or rations from the Government, but do need teachers, which they can not procure for themselves; and

Whereas the Government receives an annual revenue from Alaska of $317,500, and only returns to that country in the form of salaries of United States officers, pay of monthly mail steamer, support of steam revenue-cutter, etc., the sum of about $65,000, leaving a net revenue of over $250,000: Therefore,

We, the undersigned, citizens of the United States, do hereby memorialize your honorable body to appropriate from the revenue of Alaska in the Treasury the sum of $50,000, or so much thereof as may be necessary, to be expended by the Commis-

and on the 2d of February, 1880, Hon. Henry L. Dawes presented similar memorials in the Senate.

Through the rising public sentiment, and especially the influence of Gen. John Eaton, the Commissioner of Education, there was secured on December 1, 1880, an official recognition of the needs of Alaska when President Hayes, in his message to Congress, said with regard to Alaska:

The problem is to supply the Territory for a population so scattered and so peculiar in its origin and condition. The natives are reported to be tractable and self-supporting, and if properly instructed doubtless would advance rapidly in civilization, and a new factor of prosperity would be added to the national life. I therefore recommend the requisite legislation upon the subject.

Again on December 6, 1881, recognition was secured in the annual message to Congress of President Arthur, who says:

I regret to state that the people of Alaska have reason to complain that they are as yet unprovided with any form of government by which life or property can be protected. While the extent of its population does not justify the application of the costly machinery of territorial administration, there is immediate necessity for constituting such a form of government as will promote the education of the people and secure the administration of justice.

Again in his message to Congress December 4, 1882, President Arthur says:

Alaska is still without any form of civil government. If means were provided for the education of its people and for the protection of their lives and property the immense resources of that region would invite permanent settlers and open new fields for industry and enterprise.

Upon the 4th of February, 1882, Gen. John Eaton sent a special letter to the honorable Secretary of the Interior, calling attention anew to the need of schools in Alaska. On the 8th of the same month the Hon. S. J. Kirkwood, Secretary of the Interior, transmitted the same to the President, and upon the 15th of February, 1882, the President transmitted both letters to the Senate and House of Representatives.[2]

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sioner of Education, under the direction of the honorable Secretary of the Interior, for the establishment, under competent teachers, of schools for the instruction of the native population and creoles of Alaska in the English language, the common branches of an English education, the principles of a Republican government, and such industrial pursuits as may seem best adapted to their circumstances.

[2] *To the Senate and House of Representatives:*

I transmit herewith, for the consideration of Congress, a letter from the Secretary of the Interior, inclosing a letter from the Commissioner of Education, in which the recommendation is made that an appropriation of $50,000 be made for the purpose of education in Alaska.

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *February 15, 1882.*

DEPARTMENT OF THE INTERIOR,
Washington, February 8, 1882.

SIR: I have the honor to transmit herewith, for your consideration, a letter from the Commissioner of Education, in which he recommends that an appropriation of $50,000 be made for the establishment and maintenance of schools in Alaska.

I concur in the recommendation that the appropriation be made.

Very respectfully, S. J. KIRKWOOD, *Secretary.*

The PRESIDENT.

DEPARTMENT OF THE INTERIOR, BUREAU OF EDUCATION,
Washington, February 4, 1882.

SIR: My attention is called to the provisions of the law determining the purpose and duties of this office, which provides that it shall "collect statistics and facts

Following this movement of the highest officials of the land, a series of lectures by myself on Alaska was arranged in the various churches of the different denominations in Washington in February, 1882, and a card of invitation, giving the dates and places of said lectures, was sent to each Congressman. In April of the same year Dr. John M. Reid, secretary of the Methodist Episcopal Missions, and Dr. Henry L. Morehouse, secretary of the Baptist Home Missions, and Dr. Henry Kendall and William C. Roberts, secretaries of the Presbyterian Home Missions, at my request sent printed circulars to leading and influential men of their respective denominations throughout the United States, asking them to circulate petitions in their sections for signature, to be mailed to their respective Congressmen, asking for the establishment of schools in Alaska.

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showing the condition and progress of education in the several States and Territories, and to diffuse such information respecting the organization and management of schools and school systems and methods of teaching as shall aid the people of the United States in the establishment and maintenance of efficient school systems and otherwise promote the cause of education throughout the country;" and it is affirmed that I have not yet made any specific recommendation with regard to education in Alaska. I can not claim to be ignorant of the fact that there is no law either for the protection of life or property or for the establishment of schools in that Territory, nor would I be among those who are indifferent to facts reflecting so unfavorably upon us as a people. I have sought diligently to gather all information in regard to the education of the children of Alaskans, as will be seen by reference to the several reports of this office. Prior to the purchase of Alaska the Russian Government had schools in portions of that country. When it was transferred to the United States those schools were generally discontinued, and the entire Territory, with few exceptions, has been left without any means of education. From the census of 1880 we learn that there are about 30,000 people in Alaska, and of these it is believed there are about 10,000 children or young people who ought to have some school privileges.

With regard to this people it may be observed—

(1) That they are docile, peaceful, and have here and there some knowledge of useful industries; are apt in the mechanical arts, and anxious for instruction.

(2) They are a self-supporting people, needing no annuities, clothing, or rations from the Government, but do need teachers that they can not procure for themselves. These teachers should instruct them not only in letters, but in the arts of civilized life and the duties of American citizenship.

(3) If given an opportunity for this kind of instruction for a few years they would, it is believed, make good progress in throwing off tribal relations and in preparation to become an integral portion of the American people, thus contributing to the common wealth and prosperity of the country.

(4) It is well known that civilization in approaching an untutored people may be their destruction by sending its vices before its virtues. It is equally well known that various weeds spring up spontaneously where useful plants must be cultivated, and that not neglect but painstaking care is necessary to the improvement of the human mind.

The people of Alaska having received some measure of aid from the Russian Government, have expected the same from the United States. The natives, already to a limited extent demoralized by the introduction of intemperance and disease, it is thought, would by the introduction of schools be prepared better to resist these evils and stand a far better chance to be a permanent and prosperous race.

(5) The development of the fishing interests, the discovery of gold, and the increase of commerce in that region are now calling public attention to it, and the time seems to have arrived when school privileges should be immediately provided. In 1870 Congress appropriated $50,000 for educational purposes in Alaska, which, on account of difficulties of administration at that time, was not expended there. This amount could now be expended there, I am sure, with most satisfactory results.

In accordance, therefore, with these considerations, and in order not to come short of any duty required of me by law, I have the honor to recommend that Congress be requested to appropriate $50,000 for the establishment and maintenance of schools for instruction in letters and industry at such points in Alaska as shall be designated by the honorable Secretary of the Interior.

I have the honor to be, very respectfully, your obedient servant,

JOHN EATON, *Commissioner.*

The SECRETARY OF THE INTERIOR.

The general assembly of the Presbyterian Church in the United States of America, in session at Saratoga Springs, May, 1883, took the following action:

In view of the pressing needs of Alaska, where our missions have been singularly successful, we recommend that the general assembly appoint a committee of five persons, who shall wait upon the President of the United States and the Secretary of the Interior, asking of the Government through them the establishment of civil government among these people of Alaska, and pressing upon them the necessity of establishing industrial schools in that Territory.

At the fifty-first annual meeting of the American Baptist Home Mission Society, Saratoga Springs, May 25, 1883, the following resolution was adopted:

The committee on work among the Indians reported. * * * From the country of Alaska comes a cry for help as pitiful and as hopeless as any that ever startled Christian ears from the lands beyond the sea. What answer will our great denomination make to this repeated appeal? We repeat the recommendation made to the society a year ago, that missionaries be sent as soon as practicable to the Indians of Alaska.

The following was ordered sent to the President of the United States and the Secretary of the Interior:

Resolved, That as Alaska is the only section of the United States where Governmental or local aid has not been furnished for the education of the people; and as the establishment of schools will assist in civilizing the native population, prevent Indian wars, and prepare them for citizenship;

Therefore, the American Baptist Home Missionary Society, in session at Saratoga Springs, May, 1883, would respectfully petition you to renew your recommendation to Congress for an educational appropriation for Alaska.

Feeling the need, not only of enlisting the churches, as had been done through their central missionary societies, but also the educators of the land in behalf of Alaska, on the 23d of March, 1882, through the courtesy of Gen. John Eaton, Commissioner of Education, I was invited to address the superintendents' section of the National Education Association, at their meeting in Washington, on the needs of Alaska. The association unanimously adopted the following resolution:

Whereas the native population of Alaska have alone of all sections of our common country been overlooked in educational provisions, and whereas the President has sent to Congress a special message asking for an appropriation of $50,000 for education in Alaska, to be disbursed through the National Bureau of Education; therefore,

Resolved, That this association earnestly request the Committees on Education and Labor of the Senate and House of Representatives to give favorable consideration to the above request.

The year 1883 was signalized by the unanimous action of the various educational associations that I could visit and address. On July 11, 1883, at the twenty-second annual meeting of the National Education Association, held at Saratoga, N. Y., the following resolutions were unanimously adopted:

To the Friends of Education:

The National Education Association of the United States, in session at Saratoga Springs, July 9–11, 1883, took the following action with reference to education in Alaska:

Whereas Alaska is the only large section of the United States for which some educational provision has not been made by law; and

Whereas it is a reflection upon our interest in universal education that Alaska should be worse off than when under the control of Russia, the United States having neglected to continue the schools that for many years were sustained by the Russian Government, or substitute better ones in their places; and

Whereas the President of the United States transmitted to the last Congress a paper from the honorable Commissioner of Education, calling attention to this neglect; therefore,

they have pleaded in vain for that which they should have received without the asking. They have no law for the collection of debts, the support of education, the conveyance of property, the administration of estates, or the enforcement of contracts; none, indeed, for the punishment of criminals, except such as offend against certain customs, commerce, and navigation acts. The resources of Alaska, especially in fur, mines, and lumber, are considerable in extent, and capable of large development, while its geographical situation is one of political and commercial importance. The promptings of interest, therefore, as well as considerations of honor and good faith, demand the immediate establishment of civil government in that Territory.

Spurred by the tens of thousands of petitions, as well as the repeated messages of the President, Messrs. Miller, Platt, Harrison, Rosecrans, Phelps, and others introduced bills either in the Senate or House of Representatives for establishing a civil government of some sort for the Territory, which resulted in the adoption of what is known as the Harrison bill, creating a government and schools in Alaska, which became a law on May 17, 1884. Thus culminated my long struggle, from 1877 to 1884, for education and civil government in Alaska, during which I delivered over 900 addresses on Alaska, held public meetings in all the leading cities from the Atlantic to the Pacific, had hearings before the committees of the Forty-sixth, Forty-seventh, and Forty-eighth Congresses, besides securing the cooperation of the missionary societies and the educational interests of the entire country.

The "campaign of education" that secured from Congress schools for Alaska also secured the extension of law and government over that section.[1]

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[1] The Hon. John Eaton, LL. D., then Commissioner of Education, in his annual report for 1882–83 (pp. xlv, xlvi,) says:

"As this report is going through the press, the House of Representatives, on the 14th of May, 1884, passed the Senate bill providing a civil government for Alaska, which was signed by the President on the 17th. This act creates a governor at a salary of $3,000, a judge at $3,000, a district attorney at $2,500, a marshal at $2,500, a clerk at $2,500, four commissioners at $1,000 each and fees, and four deputy marshals at $750 each and fees. These officers are appointed by the President, with the exception of the deputy marshals, who are appointed by the marshal. The seat of government is established at Sitka. The four commissioners and four deputy marshals are to reside respectively at Sitka, Wrangell, Juneau, and Unalaska.

"The laws of Oregon, so far as applicable, are extended over the district. A term of the district court is to be held each year at Sitka, commencing on the first Monday of May, and one at Wrangell, beginning on the first Monday in November. No provision is made for a territorial legislature or a Delegate in Congress. The general land laws of the United States are not extended over the country. The squatter rights of Indians and others are recognized. Mission stations are continued in the occupancy of the 640 acres now claimed by them. The owners of mining claims can perfect their titles in the usual way.

"The governor is required to inquire into the operations of the Alaska Commercial Company and annually report to Congress the result of such inquiries and any and all violations by said company of the agreement existing between the United States and said company.

"The Secretary of the Interior is directed to select two of the officers, who, together with the governor, shall constitute a commission to examine into and report upon the condition of the Indians residing in said Territory; what lands, if any, should be reserved for their use; what provision shall be made for their education; what rights by occupation of settlers should be recognized, and all other facts that may be necessary to enable Congress to determine what limitations or conditions should be imposed when the land laws of the United States shall be extended to said district.

"The importation, manufacture, and sale of intoxicating liquors in said district, except for medicinal, mechanical, and scientific purposes, are prohibited.

"The Secretary of the Interior is directed to make needful and proper provision for the education of the children of school age in the Territory of Alaska, without reference to race, until such time as permanent provision shall be made for the same, and the sum of $25,000 is appropriated for this purpose.

"Thus, after seventeen years of delay, a government has been secured for Alaska. In respect to this successful result this Bureau has endeavored to do its whole duty by obtaining trustworthy information in regard to the condition of the inhabitants

ESTABLISHMENT OF PUBLIC SCHOOLS.

On the 2d day of March, 1885, the honorable Secretary of the Interior assigned the work of making provision for the education of the children in Alaska to the Bureau of Education.

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and their educational needs, and by furnishing it to the Government officers and to the people. In this effort Prof. W. H. Dall, of the United States Coast Survey, and Rev. G. H. Atkinson, D. D., of Oregon, were especially helpful.

"The report of this office for 1870 had a notice of education in Alaska, and year after year these notices were continued as data warranted.

"In 1876 the Commissioner of Education, as representative of the Department of the Interior, expended a portion of the funds under his control to secure a representation of native life in Alaska for the Centennial Exposition at Philadelphia.

"In February, 1882, a special report from this office on education in Alaska, recommending an appropriation of $50,000 for schools, was made to the Secretary of the Interior, and by him forwarded to Congress through the President.

"In 1877 Rev. Sheldon Jackson, D. D., superintendent of Presbyterian missions for the Rocky Mountain Territories, having had his attention called to Alaska, visited the southeastern portion, and established the first American school in that section on the 10th of August, 1877, with Mrs. A. R. McFarland as teacher. Later he established schools at Sitka, Haines (Chilkats), Boyd (Hoonahs), and Jackson (Hydahs). Returning to the States, Dr. Jackson commenced an agitation to arouse the dormant public sentiment of the country in behalf of a government and schools for Alaska. He held public meetings in many of the leading cities and many of the prominent towns from the Pacific to the Atlantic, delivering, from 1878 to 1884, about nine hundred addresses on Alaska. He went before committees of the Forty-sixth, Forty-seventh, and Forty-eighth Congresses, and with unflagging zeal sought to enlist the interest of Congressmen. He secured the hearty cooperation of the missionary societies of the Baptist, Methodist, Congregational, Episcopal, Moravian, and Presbyterian churches.

"In 1880 he published a book on Alaska, and on March 23, 1882, delivered an address before the Department of Superintendence of the National Educational Association, which was printed by this Bureau in Circular of Information No. 2, 1882. Of this circular three editions have been called for, making an aggregate of 60,000 copies. During the summer of 1883 he visited the twenty-second annual meeting of the National Educational Association of the United States, the second National Educational Assembly, and the State Teachers' Associations of Vermont, New Hampshire, Massachusetts, and Connecticut, each of which passed strong resolutions asking Congress to provide a school system for Alaska.

"Through these meetings the teachers became interested, and thousands of petitions, from teachers scattered from Maine to Texas and from Florida to Oregon, were sent to Congressmen, asking for schools for Alaska. So persistent and continuous was the pressure invoked by Dr. Jackson from so many, varied, and widely separated forces, that when the bill was reached Congress passed it with great unanimity."

HOUSE OF REPRESENTATIVES, *Washington, D. C., May 1, 1885.*

MY DEAR SIR: In view of the very great and general interest manifested in regard to everything pertaining to Alaska, I feel like congratulating you on the reward you are now receiving for your long, unwearied, and very efficient labors on behalf of that distant portion of our country. When I remember your faithful work for Alaska while you were superintendent of Presbyterian Missions for the Rocky Mountain Territories, your able and successful efforts to arouse public sentiment in behalf of a government and schools for Alaska, and your addresses all over the country on the subject, taken with what has come under my personal observation while a Member of the Forty-eighth Congress and a member of the Committee on Territories and on the subcommittee having in charge the bill proposing a civil government for Alaska, I say without any hesitation that in my humble judgment, to you more than to any other one man or agency is due the success thus far attained in the direction of the establishing of a form of government and the improvement in the condition of the inhabitants of Alaska. I took from the first a special interest in the bill before our committee because of the information you furnished and your connection with the matter. Please accept my sincere congratulations on your appointment as the first superintendent of public instruction for Alaska, and believe me

Yours, very truly,

F. A. JOHNSON,
Member of Congress, Twenty-first District, New York.

REV. SHELDON JACKSON, D. D.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., March 2, 1885.

SIR: Section 13 of the act providing a civil government for Alaska devolves upon the Secretary of the Interior the duty of making needful and proper provision for the education of children of school age in that Territory until permanent provision shall be made for the same.

The nature of the duties assigned by section 516 of the Revised Statutes to the Commissioner of Education would seem to point him out as the proper officer through whom the purpose of Congress should be carried into execution.

I have to request, therefore, that you prepare a plan of operation and initiate such steps as are necessary and proper for carrying into effect the legislation above referred to, reporting the results of the same as may be hereafter directed by the Secretary of the Interior or whenever in your judgment there may be occasion for so doing.

Very respectfully, etc.,

H. M. TELLER, *Secretary.*

The COMMISSIONER OF EDUCATION.

It was a work of great magnitude, in a new and untried field, and with unknown difficulties. It was a work so unlike any other that the experience of the past in other Departments could not be the sole guide. It was a problem peculiar to itself, and must be worked out by and for itself. It covered an area of one-sixth of the United States. The schools to be established would be from 4,000 to 6,000 miles from headquarters at Washington and from 100 to 1,000 miles from one another; and that in an inaccessible country, only one small corner of which has any public means of intercommunication. The teachers of five schools in southeastern Alaska would be able to receive a monthly mail; the larger number of the others could only receive a chance mail two or three times a year, and still others only one annually.

It was to establish English schools among a people the larger portion of whom do not speak or understand the English language, the difficulties of which will be better appreciated if you conceive of an attempt being made to instruct the children of New York or Georgia in arithmetic, geography, and other common-school branches through the medium of Chinese teachers and text-books. Of the 36,000 people in Alaska, not over 2,000 speak the English tongue, and they are mainly in three settlements.

It was to instruct a people, the greater portion of whom are uncivilized, who need to be taught sanitary regulations, the laws of health, improvement of dwellings, better methods of housekeeping, cooking, and dressing, more remunerative forms of labor, honesty, chastity, the sacredness of the marriage relation, and everything that elevates man. So that, side by side with the usual school drill in reading, writing, and arithmetic, there is need of instruction for the girls in housekeeping, cooking, and gardening, in cutting, sewing, and mending; and for the boys in carpentering and other forms of woodworking, boot and shoe making, and the various trades of civilization.

It was to furnish educational advantages to a people, large classes of whom are too ignorant to appreciate them, and who require some form of pressure to oblige them to keep their children in school regularly. It was a system of schools among a people who, while in the main only partially civilized, yet have a future before them as American citizens.

It was the establishment of schools in a region where not only the schoolhouse but also the teacher's residence must be erected, and where a portion of the material must be transported from 1,500 to 4,500 miles, necessitating a corresponding increase in the school expenditure.

It was the finding of properly qualified teachers who, for a moderate salary, would be willing to exile themselves from all society, and some

of them settle down in regions of arctic winters, where they can hear from the outside world only once a year.

To the magnitude of the work, and the special difficulties environing it, is still further added the complication arising from the lack of sufficient funds to carry it on, there being appropriated only $25,000 with which to commence it.

On the 9th of April the Commissioner of Education addressed a communication[1] to the honorable Secretary of the Interior, requesting authority to appoint a general agent to take charge of the Alaska work, and upon the 11th of April, 1885, the Secretary granted the request and directed the establishment of the office of "general agent of education in Alaska."

On the 11th of April, 1885, Rev. Sheldon Jackson, D. D., was appointed by the Commissioner of Education general agent of education in Alaska and at once entered upon the work.

In southeastern Alaska the establishment of schools, in comparison with the difficulties met in other sections of this land, was easy, as four of the seven schools can be reached monthly by the mail steamer. Further, schools had been kept at all these points but two for several years by teachers in the employ of the Board of Home Missions of the

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[1] DEPARTMENT OF THE INTERIOR, BUREAU OF EDUCATION,
Washington, D. C., April 9, 1885.

SIR: In carrying out the orders of the Department under the law providing for the establishment of common schools in Alaska, I find a condition of facts which I wish to submit to your consideration, together with a recommendation. The nearest school in Alaska will be about 4,500 miles from Washington, and all of the schools will be widely separated from each other, some of them doubtless over 6,000 miles from this city. The appropriation of $25,000 for the entire work is very small, and much should be done in the way of inducing the communities where there is money to cooperate in bearing expenses, and thus increasing the amount to be accomplished by the small fund at command. I see no way to organize schools sufficiently under these circumstances but by the appointment of someone in Alaska as a general agent of education.

Residing at Sitka, this superintendent could go out in the naval vessel to visit the several chief centers of population, where schools can be established, and interest the people, judge intelligently of the requirements for buildings, teachers, etc., and thus furnish the data for intelligent direction of the schools here in Washington. I therefore recommend that a general agent of education for Alaska be appointed by the Secretary of the Interior, to report to this office for orders and instructions, at a nominal salary of $1,200 a year, which will but little more than cover expenses. Before concluding to make this recommendation I may add that I have conferred with a considerable number of very intelligent persons who have visited Alaska, all of whom thoroughly concur in the view that it would be impossible to manage schools there efficiently without a local superintendent.

The governor of the Territory when here recently expressed himself to the same effect. In looking for the proper person to become such an agent, I find no one either so well qualified or so strongly recommended as Mr. Sheldon Jackson. He has repeatedly visited considerable portions of the country, and written a book which is a popular source of information in regard to its people and their progress, and led the way in the establishment of the schools at present taught in the Territory, and is now their superintendent. He was unanimously recommended for the position of superintendent of instruction by all of the private organizations some time since aiming to promote education in Alaska, and by a considerable number of prominent men. I have known Mr. Jackson thoroughly for a considerable number of years. He is a Christian gentleman of excellent ability, great energy, and, I believe, specially fitted to carry through successfully the plans of establishing schools in that far-off country.

I have the honor to be, very respectfully, your obedient servant,
JOHN EATON, *Commissioner.*

The SECRETARY OF THE INTERIOR,
Washington, D. C.

Approved:
L. Q. C. LAMAR, *Secretary.*

Presbyterian Church. This missionary organization was the first of the American churches to enter that neglected land. Finding no schools, they established them side by side with their missions, proposing to furnish educational advantages until the General Government should be ready to do it. Therefore whenever the Government was ready to undertake the work in any village occupied by the Presbyterians, they turned over their schools to the Government. As the Presbyterians had a body of efficient teachers already on the ground, acclimated, experienced in the work, more or less acquainted with the native language, and possessing the confidence of the people, it was both more economical to the Government and for the best interests of the schools that they should as far as possible be reemployed, which was done.

Special requests having been received for an early inauguration of the public-school system in Sitka and Juneau, I gave them my first attention.

Sitka.—By permission of the collector of the port, who is the custodian of the Government buildings, I took possession of a log house in the center of the village and repaired it as best I could under the circumstances. In this building a school was opened on June 22, 1885, with Miss Margaret Powell, of western Pennsylvania, as teacher. The pupils were from white and Russian creole families. On the 16th of November, 1885, a public school was established for the native children, with Miss Kate A. Rankin, of western Pennsylvania, as teacher.

Juneau.—This was the principal mining center of Alaska, with the largest American population of any place in the Territory. A log carpenter shop was erected and fixed up for the schoolroom, and the school opened on the 1st of June with Miss Marion B. Murphy, of Oregon, as teacher. Looking forward to the erection of a suitable school building in the near future, I selected a block of land in the center of the village, with the concurrence of the United States Commissioner, and had a cheap fence thrown around it, in order to secure it for school purposes.

Hoonah.—This important village is 130 miles by water north from Sitka. The school, originally started by the Presbyterian Board of Home Missions, was transferred to the Government and the fall term opened on Tuesday, September 1, the teacher being Mrs. Maggie Dunbar McFarland, wife of the missionary at that place.

Fort Wrangell, 333 miles southeast of Sitka, had a school which had been under way since 1877, supported by the Woman's Home Missionary Society of the Presbyterian Church. It was transferred to the Government and opened the 1st day of September, with Miss Lydia McAvoy as teacher.

Haines (200 miles by water north of Sitka).—This school likewise was transferred from the missionary society and was opened the 1st of September, with Miss Sarah M. Dickinson, an educated half-breed, as teacher.

Jackson.—This village is 533 miles by water south of Sitka. The school that had been opened by the Presbyterian missionaries in 1881 was likewise transferred to the Government and opened as a public school on the 1st of September, 1885, with Miss Clara A. Gould as teacher.

There being no regular communication between Sitka and western Alaska, and as it would take the entire season to go from Sitka to San Francisco, visit the leading places in western Alaska and return, I was unable the first year to do more for that section than to send Mr. Salo-

mon Ripinsky to Unalaska, where a school was opened in October, 1885.

Communication with interior Alaska in 1885 was very difficult. If I wished to visit the school on the Yukon River, my nearest way was to take the mail steamer from Sitka to Juneau, 166 miles, then hire a canoe and natives to take me, together with blankets and provisions, to the head of Dyya Inlet, about 100 miles. Then leaving the water, a fresh crew of natives would be hired to carry my supplies 25 miles on foot, over a dangerous mountain trail, to the upper waters of the Yukon, then construct a raft and float down the stream, 1,500 miles to Nulato, or 1,750 miles to Anvik. The trip would occupy two months. Another practicable way was to take the mail steamer to San Francisco, 1,600 miles, then a chance steamer to St. Michaels, 3,264 miles, then a small river steamer that makes one trip a year to Nulato, 769 miles, a total distance of 5,633 miles. To make the trip and return in the same year would require close connections.

If I wished to visit the school at Bethel, I could take a mail steamer from Sitka to San Francisco, 1,600 miles, then wait until some vessel sailed for Unalaska, 2,418 miles, then wait again until some trading vessel had occasion to visit the mouth of the Kuskokvim River, 461 miles, and go from thence in a bidarka (sea-lion-skin canoe) 150 miles up the river, a total of 4,629 miles. By the same tedious route the teachers received their annual mail, except that it started from San Francisco.

During the summer of 1884 the American branch of the Moravian Church, upon my representation, had sent a commission, consisting of Rev. A. Hartman and Rev. H. Weinland, to visit the western section of Alaska and secure a suitable location for a mission to the Eskimos. The result of their exploration was the locating of a mission station named Bethel, 150 miles up the Kuskokvim River.

On the 18th of May, 1885, a party consisting of Rev. William H. Weinland and Rev. J. H. Killbuck (Delaware Indian) and their wives, with Mr. John Torgerson, the mechanic and lay assistant, sailed from San Francisco, reaching the mouth of the Kuskokvim on the 19th of June. Being on the ground, I appointed Mr. J. H. Killbuck teacher at Bethel.

At Killisnoo, 80 miles northeast of Sitka, a school was opened in January, 1886, with George B. Johnston as teacher. The same winter Mr. Louis Paul, a native, was sent to open a school at Port Tongass.

Having given the entire school year for 1885–86 to the organization of public schools in southeastern Alaska, I commenced early arrangements to make a trip to western Alaska during 1886–87.

The work of education in Alaska for 1886–87 was greatly hindered by the delay of Congress in making the appropriation. Until it was definitely known how much would be appropriated for education no plan of work could be arranged. Until the appropriation was actually made the office was left in doubt whether it would be able to enlarge the work, or merely continue existing schools, or disband them.

The appropriation was not made until August, 1886. In the meantime the trading vessels that sail from San Francisco to Bering Sea in the spring and return in the fall had all sailed, and with them the only regular opportunity of sending teachers and school supplies to western Alaska. To wait until the following spring would involve the delay of another year in establishing the schools. Under the circumstances there was no alternative but to charter a vessel for the work of the

Bureau. This, in addition to meeting a necessity, enabled the Commissioner to secure reliable information concerning the educational needs of the principal centers of population among the civilized Russians, Aleuts, and Eskimos of southern and southwestern Alaska.

With the commencement of the public agitation, which resulted in securing schools for Alaska, the Commissioner had sought diligently for reliable and explicit information concerning that unknown region. When, in 1885, the responsibility of establishing schools in that section was placed upon him, he more than ever felt the need of the information that was necessary for intelligent action in the school work. An application was then made to the honorable Secretary of the Navy, and he issued instructions to the commanding officer of the U. S. S. *Pinta*, then in Alaskan waters, to take the general agent of education in Alaska on a tour of inspection along the coast. A combination of circumstances prevented the ship from making the trip.

The necessity which arose in the fall of 1886 of sending the teachers furnished the long-desired opportunity of securing the needed information.

The schooner *Leo*, of Sitka, was chartered, because the terms were lowest, and because the vessel had auxiliary steam power, which enabled it to get in and out of harbors and through the narrow channels between the islands, where, without this auxiliary power, we would have been delayed weeks.

The cruise proved a stormy one, consuming one hundred and four days. Passing through the equinoctial storms, we encountered the early winter gales of that high latitude. We lost 2 sails, were stranded on a reef of rocks, nearly lost a sailor overboard, while repeatedly great seas washed completely over us.

Taking on board of the *Leo* Mr. John H. Carr and wife, Mr. W. E. Roscoe, wife and child, Rev. and Mrs. James A. Wirth, and Rev. and Mrs. L. W. Currie and child, together with their household effects and provisions, also necessary school supplies, I sailed from Puget Sound September 3. Visits were made to Kadiak, Wood Island, Spruce Island, Afognak, Karluk, Akhiok, Ayakharalik, Kaguiak, Unga, Belskofsky, Unalaska, Jackson, Klawak, Tuxikan, Sitka, Killisnoo, Hoonah, Juneau, Douglas, Wrangell, Loring, and Port Tongass. At Unga, on the Shumagin Island, I landed Mr. and Mrs. John H. Carr with school books, desks, etc., for the establishment of a school. Mr. and Mrs. W. E. Roscoe were similarly landed at Kadiak; Rev. and Mrs. James A. Wirth were landed through the breakers at Afognak, and the Rev. L. W. Currie and family were landed at Tuzikan, at all of which places schools were established.

On the 1st day of July, 1886, a contract was entered into with Dr. William S. Langford, secretary of the Protestant Episcopal Mission Board of New York City, by which Rev. Octavius Parker, of Oregon, was appointed teacher and directed to establish a school in the Yukon Valley. Being unable to reach his destination the first season, the school was opened temporarily at St. Michael on the coast. A similar contract was made with the officers of the missionary society of the Moravian Church to establish a school at the mouth of the Nushagak River. Rev. Frank E. Wolff, of Wisconsin, accompanied by his family and Miss Mary Huber, were sent as teachers to that place. These schools, with the one at Bethel, 500 miles from each other, and central to a population of from 10,000 to 12,000 uncivilized Eskimos in western Alaska, were the entering wedges to the civilization of that whole great region—the beginning of better things. Prof. S. A. Saxman and

wife were transferred from Loring, which school was abandoned, to Fort Tongass. The year 1887 was marked by the visit to southeastern Alaska of the Hon. N. H. R. Dawson, then Commissioner of Education; also the establishment by the Secretary of the Interior of a Territorial board of education composed of the governor of the Territory, the judge of the United States district court, and the general agent of education. Under the new order of things a set of rules and regulations for governing the schools of Alaska was issued by the Secretary of the Interior on June 15, 1887. The year was also noted by the removal of some 700 civilized and christianized Tsimpshean natives, under the lead of Mr. William Duncan, from Metlakahtla, British Columbia, to Point Chester, Annette Island, Alaska. The colony was called New Metlakahtla.

The school temporarily established the previous year at St. Michael on the coast of Bering Sea was removed to Anvik in the Yukon Valley. During the year a second school was established at Juneau for the use of the native children. Considerable friction was developed by the attempt to unite the children of the white and native population in the same schoolroom. During the year a school building was erected by the Government at Killisnoo. This was the first school building erected by the Government in Alaska.

The native industrial training school, Sitka, Alaska, was established by the Woman's Missionary Society of the Presbyterian Church in 1880. In the absence of any public provision by the Government for needy orphans, they were freely received into the school. Small children whose mothers had died, and for whom there was no one to care, were also received. It became a refuge for homeless and friendless waifs, for children fleeing for their lives from the tortures of witchcraft. It gave them a good home and a training that made them good citizens instead of allowing them to grow up vagabonds. It also became a reformatory to which the United States district court, not knowing what else to do with young offenders, committed them. It was the only place in Alaska where a young man could learn a trade. It also became the high school to which bright pupils in the various day schools desiring greater advantages than their local school could afford them were advanced. It also, to a limited extent, gave normal training to the first of the native teachers of the country. In 1884 it was made a contract school under the Indian Bureau of the Government, but in 1887 it was transferred to the care of the Bureau of Education, with an enrollment of 186 pupils, representing 15 nationalities or tribes. During the year an English school and mission was opened at Yakutat by Rev. Adolf Lydell, representing the Swedish Evangelical Mission Union of the United States. During the school year 1887–88, schoolhouses were erected at Sitka and Juneau, and the Government hospital at Wrangell refitted and made into a comfortable schoolroom. The school year 1887–88 was marked by the death of Rev. L. W. Currie, teacher at Klawack, the erection of a building for school No. 2 at Sitka, the transference of 2 boys and 4 girls from the training school at Sitka to the East for education. The 4 girls were sent to the Ladies' Seminary at Northfield, Mass., at the expense of Mrs. Elliott F. Shepard. The 2 boys were cared for at the Indian school at Carlisle.

During the year 1888–89 the former school board of three was increased to five by the addition of the United States commissioner at Fort Wrangell and Mr. William Duncan, superintendent of the colony of Metlakahtla. In 1889–90, to take effect on the 1st of July, 1890, the Secretary of the Interior issued a new set of rules and regulations for the conduct of schools and education in the District of Alaska.

Among the important changes made by the new rules was the discontinuance of the Territorial board of education, experience having proved that it did not work well, and a system of local unpaid school committees was inaugurated. Owing to the growth of the work it was deemed advisable to create the position of assistant agent. Mr. William Hamilton was appointed to this position. During the year comfortable frame schoolhouses and teachers' residences were erected at Kadiak, Karluk, and Afognak. At Douglas a substantial frame schoolhouse was erected, and at Chilcat a log schoolhouse.

Of the Alaskan children in Eastern schools Miss Frances Willard graduated at a young ladies' seminary at Elizabeth, N. J., in June, 1890, and was the first to return to Alaska and take up teaching; she was appointed assistant teacher in the industrial school at Sitka.

The inauguration of schools in Arctic and sub-Arctic Alaska among the Eskimos was the special feature of educational work in Alaska for 1890–91. Hitherto the schools had largely been confined to the North Pacific and Bering Sea coasts of Alaska, together with the valleys of the Yukon, Kuskokvin, and Nushagak rivers. But in 1889 Commander C. H. Stockton of the U. S. S. *Thetis*, who had recently returned from a cruise along the Arctic coast of Alaska, made a personal representation to me of the need of schools among the Eskimo settlements of that region. Upon reporting the request to the Commissioner of Education I was authorized to visit the headquarters of the various missionary societies and confer with the secretaries of the same with regard to the establishment of contract schools in Arctic Alaska, with the result that the Woman's Executive Committee of Home Missions of the Presbyterian Church agreed to establish a school at Point Barrow, the northernmost point of land on the main continent of North America. The American Missionary Association of the Congregationalists agreed to establish a school at Cape Prince of Wales, on Bering Straits, and the Episcopal Board of Missions at Point Hope, lying about midway between the other two. These comprised the three principal villages on that part of the coast. School buildings were erected at Cape Prince of Wales and Point Hope, and a room in the Government refuge station was secured for the school at Point Barrow.

In the spring of 1890, by permission of the Secretary of the Treasury and the courtesy of Capt. L. G. Shepard, chief of the Revenue-Cutter Service, and Capt. M. A. Healy, commanding the revenue-cutter *Bear*, I was able to visit the entire Alaska coast of Bering Sea and the Arctic Ocean; also about 100 miles of the coast of Siberia, both south and north of the Arctic Circle. As the captain of the ship had been requested to take a census of the coast villages of that region, I had unusual facilities for reaching the larger portion of the people. My trip also enabled me to attend in person to the locating of the teachers at Cape Prince of Wales, Point Hope, and Point Barrow, the erection of the buildings, and the providing of the necessary supplies. In visiting the various localities I found a great lack of sufficient food supply in the country. The ancestors of the present population had an abundant food supply in the whale and walrus of the sea and the fur-bearing animals of the land, but the destruction of the whale by the American whalers, and of fur-bearing animals by improved breech-loading firearms, had so diminished the food supply that the present inhabitants were slowly decreasing in number for want of food. While coasting along the shore of Siberia I found a barbarous people similar to the Eskimo of Alaska, with an abundant food supply because they

had large herds of domestic reindeer. As it was impossible to restock the ocean with whale as a stream could be restocked with fish, the suggestion was very natural to introduce the domestic reindeer of Siberia into Alaska, teach the Alaskan natives the management and breeding of the deer, and thus not only produce a new supply, but also lift the population a step forward in civilization, change them from hunting to herding, accumulating property, etc. Upon my return to Washington I made a report to the Commissioner of Education, which was transmitted to Congress, urging the adoption of this plan of introducing reindeer into Alaska.

During the year a large, substantial school building was erected at Yakutat and a small school building at the Kake village on Kupreanof Island.

In 1891 I made my second annual tour to the Arctic, inspecting schools on the Alaska side; also purchasing and transporting reindeer from Siberia.

The leading event of the year 1892 was the actual introduction of domestic reindeer into Alaska, an account of which is given in this report under the head of "Introduction of domestic reindeer into Alaska."

On January 10, 1892, Mr. C. H. Edwards, Government teacher at Kake, while endeavoring to protect the natives of the village where he lived from the landing of whisky contrary to law by some smugglers, was shot by them and a few days afterwards died. After the farce of a trial, the murderers were turned loose to continue their nefarious operations.

On the 29th of June, 1892, an industrial school for the instruction of Alaskan young men in the raising and breeding of reindeer was established at Port Clarence, near Bering Straits. This school was named the Teller Reindeer Station, and on the 4th of July the first reindeer for the herd were landed at this station from the revenue cutter *Bear*.

On May 1 the Hon. James Sheakley, who had been local superintendent of schools in southeastern Alaska for the past three years, resigned, and Mr. William A. Kelly was appointed in his place.

On the 19th of August, 1893, Mr. Harrison R. Thornton, teacher at Cape Prince of Wales, was shot with a bomb gun in the hands of two or three hoodlum young men, who had been debarred the privileges of the school because of misbehavior. The young men were immediately shot by their relatives and neighbors, as the only method the villagers had of showing their abhorrence of the deed.

On February 18 the schoolhouse at Killisnoo was discovered to be on fire, and burned to the ground. On account of the smallness of the appropriation for schools, the building could not be rebuilt, and the school for the time being was closed.

In the spring of 1894 I secured seven families of Norway Lapps and sent them to the reindeer station, to take the places of teachers previously secured in Siberia, a fuller account of which is found under the head of "Reindeer." During the summer and fall of 1895 school buildings were erected at Unalaska and Saxman.

I have the honor to be, very respectfully, yours,

SHELDON JACKSON,
General Agent Education for Alaska.

Statistics of education in Alaska.

Public schools.	Enrollment.										Teachers in the public schools. 1894-95.
	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.	
Afognak	(a)	35	24	55	38	37	35	40	38	38	Mrs. C. M. Colwell.
Douglas City, No. 1	(b)	(b)	67	94	50	23	25	13	30	42	L. A. Jones.
Douglas City, No. 2	(b)	(b)	(b)	(b)	92	68	24	108	87	26	Miss F. J. Work.
Fort Wrangell	50	106	106	90	83	93	49	49	54	61	Miss A. R. Kelsey.
Haines	84	43	144	128	(b)	(b)	89	54	41	64	W. W. Warne.
Jackson	87	123	110	105	87	100	100	82	90	80	Mrs. C. J. McLeod.
Juneau, No. 1	96	236	25	36	31	33	26	23	25	54	S. A. Keller.
Juneau, No. 2	(b)	(b)	67	58	51	51	75	61	65	50	Miss E. Saxman.
Kadiak	(a)	59	81	68	67	80	69	74	59	56	C. C. Solter.
Karluk	(b)	(b)	(b)	(b)	(b)	33	29	(b)	(b)	(b)	
Killisnoo	(a)	125	44	90	32	68	33	137	75	(b)	
Klawock	(a)	184	81	75	68	50	38	(b)	(b)	50	Miss A. R. Kelsey.
Sitka, No. 1	43	60	60	67	58	54	59	50	43	37	Mrs. G. Knapp.
Sitka, No. 2	77	138	60	51	83	55	54	48	110	180	Miss C. Patton.
Unga	(b)	35	26	(b)	24	(b)	33	35	36	40	O. R. McKinney.
Unalaska	.....	.....	.....	.....	.....	.....	.....	.....	24	39	J. A. Tuck.
Port Clarence	(b)	(b)	(b)	(b)	(b)	(b)	(b)	20	30	56	T. L. Brevig.
Metlakahtla	.....	.....	.....	.....	.....	.....	.....	.....	.....	105	William Duncan.
St. Lawrence Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	V. C. Gambell.
										1,030	

a Enrollment not known. *b* No school.

Appropriations for education in Alaska.

First grant to establish schools, 1884	$25,000
Annual grants, school year—	
1886-87	15,000
1887-88	25,000
1888-89	40,000
1889-90	50,000
1890-91	50,000
1891-92	50,000
1892-93	40,000
1893-94	30,000
1894-95	30,000
1895-96	30,000

Vice-President Stevenson. Governor and Mrs. Sheakley.
Mrs. Stevenson.

[Frontispiece.

TEACHERS AND PUPILS, PRESBYTERIAN MISSION SCHOOL, SITKA, ALASKA.

SENATE DOCUMENT No. 111, 54TH CONGRESS, 1ST SESSION.

REPORT

ON

INTRODUCTION OF DOMESTIC REINDEER INTO ALASKA,

WITH

MAPS AND ILLUSTRATIONS,

BY

SHELDON JACKSON,
GENERAL AGENT OF EDUCATION IN ALASKA.

1895.

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ACTION OF THE SENATE OF THE UNITED STATES.

IN THE SENATE OF THE UNITED STATES,
February 5, 1896.

Resolved, **That the Secretary of the Interior be directed to transmit to the Senate the report of Dr. Sheldon Jackson upon "The introduction of domestic reindeer into the District of Alaska for 1895."**

WM. R. COX, *Secretary.*

LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
Washington, February 7, 1896.

SIR: I am in receipt of Senate resolution of the 5th instant—

That the Secretary of the Interior be directed to transmit to the Senate the report of Dr. Sheldon Jackson upon "The introduction of domestic reindeer into the District of Alaska for 1895."

In response thereto I have the honor to transmit herewith a copy of the report indicated in the foregoing resolution.

Very respectfully,

HOKE SMITH, *Secretary.*

The PRESIDENT OF THE SENATE.

INTRODUCTION OF DOMESTIC REINDEER INTO ALASKA.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION, ALASKA DIVISION,
Washington, D. C., December 31, 1895.

SIR: When in the year 1890 I visited arctic Alaska for the purpose of establishing schools, I found the Eskimo population slowly dying off with starvation. For ages they and their fathers had secured a comfortable living from the products of the sea, principally the whale, the walrus, and the seal. The supplies of the sea had been supplemented by the fish and aquatic birds of their rivers and the caribou or wild reindeer that roamed in large herds over the inland tundra.

The supply of these in years past was abundant and furnished ample food for all the people. But fifty years ago American whalers, having largely exhausted the supply in other waters, found their way into the North Pacific Ocean. Then commenced for that section the slaughter and destruction of whales that went steadily forward at the rate of hundreds and thousands annually, until they were killed off or driven out of the Pacific Ocean. They were then followed into Bering Sea, and the slaughter went on. The whales took refuge among the ice fields of the Arctic Ocean, and thither the whalers followed. In this relentless hunt the remnant have been driven still farther into the inaccessible regions around the North Pole, and are no longer within reach of the natives.

As the great herds of buffalo that once roamed the Western prairies have been exterminated for their pelts, so the whales have been sacrificed for the fat that incased their bodies and the bone that hung in their mouths. With the destruction of the whale one large source of food supply for the natives has been cut off.

Another large supply was derived from the walrus, which once swarmed in great numbers in those northern seas. But commerce wanted more ivory, and the whalers turned their attention to the walrus, destroying thousands annually for the sake of their tusks. Where a few years ago they were so numerous that their bellowings were heard above the roar of the waves and grinding and crashing of the ice fields, last year I cruised for weeks seeing but few. The walrus, as a source of food supply, is already very scarce.

The sea lions, once so common in Bering Sea, are now becoming so few in number that it is with difficulty that the natives procure a sufficient number of skins to cover their boats, and the flesh of the walrus, on account of its rarity, has become a luxury.

In the past the natives, with tireless industry, caught and cured, for use in their long winters, great quantities of fish, but American canneries have already come to some of their streams, and will soon be found on all of them, both carrying the food out of the country and, by their wasteful methods, destroying the future supply. Five million cans of salmon annually shipped away from Alaska—and the business still in its infancy—means starvation to the native races in the near future.

With the advent of improved breech-loading firearms the wild reindeer are both being killed off and frightened away to the remote and more inaccessible regions of the interior, and another source of food supply is diminishing. Thus the support of the people is largely gone, and the process of slow starvation and extermination has commenced along the whole arctic coast of Alaska.

To establish schools among a starving people would be of little service; hence education, civilization, and humanity alike called for relief. The sea could not be restocked with whale as a stream can be restocked with fish. To feed the population at Government expense would pauperize and in the end as certainly destroy them. Some other method had to be devised. This was suggested by the wild nomad tribes on the Siberian side of Bering Straits. They had an unfailing food supply in their large herds of domestic reindeer. Why not introduce the domestic reindeer on the American side and thus provide a new and adequate food supply?

To do this will give the Eskimo as permanent a food supply as the cattle of the Western plains and sheep of New Mexico and Arizona do the inhabitants of those sections. It will do more than preserve life—it will preserve the self-respect of the people and advance them in the scale of civilization. It will change them from hunters to herders. It will also utilize the hundreds of thousands of square miles of moss-covered tundra of arctic and subarctic Alaska and make those now useless and barren wastes conducive to the wealth and prosperity of the United States.

A moderate computation, based upon the statistics of Lapland, where similar climatic and other conditions exist, shows northern and central Alaska capable of supporting over 9,000,000 head of reindeer.

To reclaim and make valuable vast areas of land otherwise worthless; to introduce large, permanent, and wealth-producing industries where none previously existed; to take a barbarian people on the verge of starvation and lift them up to a comfortable self-support and civilization is certainly a work of national importance.

Returning to Washington on November 12, 1890, I addressed to the Commissioner of Education a preliminary report of the season's work, emphasizing the destitute condition of the Alaskan Eskimo and recommending the introduction of the domestic reindeer of Siberia.

On the 5th of December following, this report was transmitted by you to the Secretary of the Interior for his information, and on the 15th

transmitted to the Senate by Hon. George Chandler, Acting Secretary of the Interior. On the following day it was referred by the Senate to the Committee on Education and Labor.

On the 19th of December Hon. Louis E. McComas, of Maryland, introduced into the House of Representatives a joint resolution (H. Res. No. 258) providing that the act of Congress approved March 2, 1887, "An act to establish agricultural experiment stations in connection with the colleges established in the several States," should be extended by the Secretary of the Interior over Alaska, with the expectation that the purchase, improvement, and management of domestic reindeer should be made a part of the industrial education of the proposed college.

The resolution was referred to the Committee on Education, and on the 9th of January, 1891, reported back to the House of Representatives for passage.

It was, however, so near the close of the short term of Congress that the resolution was not reached. When it became apparent that it would not be reached in the usual way, the Hon. Henry M. Teller, on the 26th of February, moved an amendment to the bill (H. R. No. 13462) making appropriations for sundry civil expenses of the Government for the year ending June 30, 1892, appropriating $15,000 for the introduction of domestic reindeer into Alaska, which was carried. The appropriation failed to receive the concurrence of the conference committee of the House of Representatives.

Upon the failure of the Fifty-first Congress to take action, and deprecating the delay of twelve months before another attempt could be made, I issued, with the approval of the Commissioner of Education, an appeal in the Mail and Express of New York City, the Boston Transcript, the Philadelphia Ledger, the Chicago Inter-Ocean, and the Washington Star, as well as in a number of the religious newspapers of the country, for contributions to this object. The response was prompt and generous; $2,146 were received.

As the season had arrived for the usual visit of inspection and supervision of the schools in Alaska, in addition to my regular work for the schools I was authorized to commence the work of introducing domestic reindeer into Alaska. The natives of Siberia who own the reindeer, knowing nothing of the use of money, an assortment of goods for the purpose of barter for the reindeer was procured from the funds so generously contributed by benevolent people.

The honorable Secretary of the Treasury issued instructions to Captain Healy to furnish me every possible facility for the purchase and transportation of reindeer from Siberia to Alaska. The honorable Secretary of State secured from the Russian Government instructions to their officers on the Siberian coast also to render what assistance they could, and on May 25, 1891, I again took passage on the revenue cutter *Bear*, Captain Healy in command, for the coast of Siberia.

The proposition to introduce domestic reindeer into Alaska had ex-

cited widespread and general interest. In the public discussions which arose with regard to the scheme, a sentiment was found in some circles that it was impracticable; that on account of the superstitions of the natives they would be unwilling to sell their stock alive; further, that the nature of the reindeer was such that he would not bear ship transportation, and also that, even if they could be purchased and safely transported, the native dogs on the Alaskan coast would destroy or the natives kill them for food. This feeling, which was held by many intelligent men, was asserted so strongly and positively that it was thought best the first season to make haste slowly, and instead of purchasing a large number of reindeer to possibly die on shipboard or perhaps to be destroyed by the Alaskan dogs (thus at the very outset prejudicing the scheme), it was deemed wiser and safer to buy only a few.

Therefore, in the time available from other educational duties during the season of 1891, I again carefully reviewed the ground and secured all possible additional information with regard to the reindeer, and, while delaying the actual establishment of a herd until another season, refuted the correctness of the objections that the natives will not sell and the deer will not bear transportation by actually buying and transporting them.

The work was so new and untried that many things could only be found out by actual experience.

First. The wild deer men of Siberia are a very superstitious people, and need to be approached with great wisdom and tact. If a man should sell us deer and the following winter an epidemic break out in his herd, or some calamity befall his family, the Shamans would make him believe that his misfortune was all due to the sale of the deer.

Second. The Siberian deer men are a nonprogressive people. They have lived for ages outside of the activities and progress of the world. As the fathers did, so continue to do their children. Now, they have never before been asked to sell their deer; it is a new thing to them, and they do not know what to make of it. They were suspicious of our designs. Another difficulty arises from the fact that they can not understand what we want with the reindeer. They have no knowledge of such a motive as doing good to others without pay.

As a rule, the men with the largest herds, who can best afford to sell, are inland and difficult to reach. Then business selfishness comes in. The introduction of the reindeer on the American side may to some extent injuriously affect their trade in deer skins. From time immemorial they have been accustomed to take their skins to Alaska and exchange them for oil. To establish herds in Alaska will, they fear, ruin this business.

Another difficulty experienced was the impossibility of securing a competent interpreter. A few of the natives of the Siberian coast have spent one or more seasons on a whaler, and thus picked up a very little English. And upon this class we have been dependent in the past.

MODEL COTTAGES, SITKA, ALASKA.

(These cottages were built and paid for by the graduates of the Presbyterian Industrial Training School, Sitka, and are occupied by their Thlinget owners.)

However, notwithstanding all these difficulties and delays, Captain Healy, with the *Bear*, coasted from 1,200 to 1,500 miles, calling at the various villages and holding conferences with the leading reindeer owners on the Siberian coast. Arrangements were made for the purchase of animals the following season. Then, to answer the question whether reindeer could be purchased and transported alive, I bought 16 head, kept them on shipboard for some three weeks, passing through a gale so severe that the ship had to "lie to," and finally landed them in good condition at Amaknak Island, in the harbor of Unalaska.

Upon my return to Washington City in the fall of 1891 the question was again urged upon the attention of Congress, and on the 17th of December, 1891, Hon. H. M. Teller introduced a bill (S. 1109) appropriating $15,000, to be expended under the direction of the Secretary of the Interior, for the purpose of introducing and maintaining in the Territory of Alaska reindeer for domestic purposes. This bill was referred to the Committee on Agriculture and Forestry, Hon. Algernon S. Paddock, chairman. The committee took favorable action, and the bill was passed by the Senate on May 23, 1892. On the following day it was reported to the House of Representatives and referred to the Committee on Appropriations. A similar bill (H. R. 7764) was introduced into the House of Representatives by Hon. A. C. Durborow and referred to the Committee on Agriculture.

On April 15 Hon. S. B. Alexander, of North Carolina, reported the bill to the House of Representatives with the approval of the Committee on Agriculture. The bill was placed on the calendar, but failed to pass the House.

On the 2d of May, 1892, I started for my third summer's work on the coast of Siberia and Arctic Alaska in the United States revenue cutter *Bear*, Capt. M. A. Healy, commanding, and, upon the 29th of June following, selected in the northeast corner of Port Clarence (the nearest good harbor to Bering Straits on the American side) a suitable location for the establishment of an industrial school, the principal industry of which is the management and propagation of domestic reindeer. The institution is named the Teller Reindeer Station.

During the summer of 1892 I made five visits to Siberia, purchasing and transporting to Port Clarence 171 head of reindeer. I also superintended the erection of a large building for the officers and residence of the superintendent of the station, Mr. Miner W. Bruce, of Nebraska.

Returning to Washington in the early winter, agitation was at once commenced before Congress, resulting in an appropriation by the Fifty-second Congress, second session (March 3, 1893), of "$6,000, to be expended under the direction of the Secretary of the Interior, for the purpose of introducing and maintaining in the Territory of Alaska reindeer for domestic purposes." The management of this fund was wisely laid upon the Commissioner of Education and was made a part of the school system of Alaska.

During the spring of 1893, 79 fawns were born to the herd at the Teller Reindeer Station, and during the summer 127 deer were purchased in Siberia and added to the Alaska herd.

At the expiration of his year's service Mr. Bruce resigned, and Mr. W. T. Lopp, of Indiana, was appointed superintendent.

During April, May, and June, 1894, 186 fawns were born to the herd, of which 41 were lost by being frozen or deserted by their mothers. During the summer I purchased in Siberia 120 head, which were added to the herd.

Siberian herders were employed at the beginning of the enterprise, not because they were considered the best, but because they were near by and were the only ones that could be had at the time. It was realized from the first that if the Alaskan Eskimo were to be taught the breeding and care of the reindeer, it was important that they should have the benefit of the most intelligent instructors and of the best methods that were in use. By universal consent it is admitted that the Lapps of northern Europe, because of their superior intelligence (nearly all of them being able to read and write and some of them being acquainted with several languages), are much superior to the Samoyedes deer men of northern Europe and Asia and the barbarous deer men of northeastern Siberia. Intelligence applied to the raising of reindeer, just as to any other industry, produces the best results.

Therefore, when in 1893 it was ascertained that the herd at Port Clarence had safely passed its first winter (thus assuring its permanence), I at once set about securing herders from Lapland. There being no public funds available to meet the expense of sending an agent to Norway in order to secure skilled Lapp herders, I had recourse again to the private benefactions of friends of the enterprise, and $1,000 was contributed.

Mr. William A. Kjellmann, of Madison, Wis., was selected as superintendent of the Teller Reindeer Station and sent to Lapland for herders. He sailed from New York City February 21, and landed upon his return May 12, 1894, having with him seven men, their wives and children, making sixteen souls in all. This was the first colony of Lapps ever brought to the United States. They reached the Teller Reindeer Station safely on July 29, having traveled over 12,500 miles. Upon reaching the station Mr. Kjellmann took charge, relieving Mr. W. T. Lopp, who desired to return to the mission work at Cape Prince of Wales.

In 1894 the Fifty-third Congress, second session, increased the reindeer appropriation to $7,500, and the same amount was appropriated in the spring of 1895, at the third session of the same Congress.

1895.

The accompanying report of Mr. William A. Kjellmann (Appendix B) upon the conduct of the Teller Reindeer Station and reindeer herd is so full and satisfactory that I will not even attempt to summarize it, but rather urge its careful reading.

LOADING REINDEER ON SHIPBOARD

Published by courtesy of "Our Animal Friends."

Owing to the serious illness of his wife, and her need of the services of a physician, that could not be had at the station, Mr. Kjellmann resigned on the 20th of July and returned to the States. The same day Mr. Jens C. Widstead, of Wisconsin, the assistant superintendent, was made superintendent, and Mr. Thorvaald Kjellmann, of Norway, was appointed his assistant.

Having spent five consecutive seasons in arctic and subarctic Alaska and Siberia establishing and supervising schools and the introduction of reindeer, I felt the need of giving a season to the work in southeast Alaska. To accomplish this Mr. William Hamilton, my assistant, made the arctic cruise this season. The itinerary for 1895 is therefore written by him and is incorporated in an appendix (Appendix A).

The experience of the past year has demonstrated the wisdom of procuring Lapps for herders. Their greater intelligence, skill, and gentleness in handling the deer, and the introduction of their improved methods of treatment, have greatly promoted the welfare of the herd. In 1894, 41 fawns out of the 186 born were lost under the supervision of the Siberian herders. This spring under the care of the Lapps but 22 fawns were lost of 298 born at the three stations, and 7 of these were from the 75 born at Cape Prince of Wales, where no Lapp was present, thus reducing the percentage of loss among the calves the past spring from 22 per cent in the previous year to about 6 per cent for the present year. This great saving is due to the greater skill of the Lapps, and would alone pay the extra expense of procuring them as herders. It has also been found that there is a hearty agreement in the work between the Lapps and the Eskimo.

Last fall a commencement was made in the distribution from the central herd at the Teller Station. In August, 1894, 119 head of deer were given to Mr. W. T. Lopp, in charge of the mission of the American Missionary Association at Cape Prince of Wales. This spring the herd was increased by the birth of 75 fawns (Appendix C).

Instructions were left in fall of 1895 to furnish similar herds to the Swedish Evangelical mission at the head of Norton Sound and to the Episcopalians and Roman Catholics on the Yukon River.

The Eskimo have been so little accustomed to assistance from the whites that they have been somewhat skeptical concerning their being permitted to ultimately own the reindeer. As evidence of good faith, in February last a herd of 115 head was entrusted to three or four of the most experienced native apprentices, with an agreement that they were to own the natural increase. This spring during fawning season a Lapp was sent to their assistance, and they lost only 2 fawns out of the 79 born.

The experience of the past four years has demonstrated the fact that the present system of procuring reindeer is too slow, and will take many years to accomplish the purpose of the Government. To expedite matters I would respectfully suggest the propriety of placing, with

There are in northern and central Alaska, at a moderate esti 400,000 square miles of territory that are unadapted to agriculture grazing of cattle, and that region is without an adequate food s for the Eskimo inhabitants or the white miners and others who ar penetrating it in search of gold or trade. But that whole regi supplied with a long, fibrous white moss (*Cladonia rangiferina* natural food of the reindeer. This is capable of becoming foo clothing for men only by its transformation into reindeer meat and

The best results in the raising of reindeer, and the most con statistics, are found in Norway and Sweden. Taking those cou as a basis, we find that the northern provinces known as Laplan tain an area of 14,000 square miles, in which are 322,568 head of deer. This gives an average of 23 reindeer to the square mile.

Applying this ratio to the 400,000 square miles of arctic and arctic Alaska (and there is no known reason in the general cha of the country why we should not), we have as a result that A is capable of sustaining 9,200,000 head of reindeer, which, at the ation of $9 each (the price in Sweden), will be worth $83,000,000.

In Lapland there is an average of 32 head of reindeer to each p among the reindeer Lapps. Applying the same average to Al the 9,200,000 head of reindeer will support a population of 28 living like the Lapps of Lapland.

EFFECT UPON ALASKA.

The stocking of Alaska with reindeer means—

First. The opening up of the vast and almost inaccessible regi northern and central Alaska to white settlers and civilization.

The original purpose in 1890 to introduce reindeer into Alask

THLINGET HOUSE. INTERIOR CARVINGS AND CEREMONIAL GARMENTS.
Photograph by Winter & Pond, Juneau, Alaska. (Copyright.)

But that vast region, with its perpetual frozen subsoil, is without agricultural resources. Groceries, breadstuffs, etc., must be procured from the outside. Steamers upon the Yukon can bring food to the mouths of the gold-bearing streams, but the mines are often many miles up these unnavigable streams. Already great difficulty is experienced in securing sufficient food by dog-train transportation and the packing of the natives. The miners need reindeer transportation.

Again, the development of the mines and the growth of settlements upon streams hundreds of miles apart necessitates some method of speedy travel. A dog team on a long journey will make on an average from 15 to 25 miles a day, and in some sections can not make the trip at all, because they can not carry with them a sufficient supply of food for the dogs, and can procure none in the country through which they travel. To facilitate and render possible frequent and speedy communication between these isolated settlements and growing centers of American civilization, where the ordinary roads of the States have no existence and can not be maintained except at an enormous expense, reindeer teams that require no beaten roads, and that at the close of a day's work can be turned loose to forage for themselves, are essential. The introduction of reindeer into Alaska makes possible the development of the mines and the support of a million miners.

Second. The opening up of a vast commercial industry. Lapland, with 400,000 reindeer, supplies the grocery stores of northern Europe with smoked reindeer hams, 10 cents per pound; smoked tongues, at 10 cents each; dried hides, at $1.25 to $1.75 each; tanned hides, $2 to $3 each, and 23,000 carcasses to the butcher shops, in addition to what is consumed by the Lapps themselves.

Fresh reindeer meat is considered a great delicacy. Russia exports it frozen, in carloads, to Germany. The Norwegian Preserving Company use large quantities of it for canning.

The tanned skins (soft and with a beautiful yellow color) have a ready sale for military pantaloons, gloves, bookbinding, covering of chairs and sofas, bed pillows, etc.

The hair is in great demand for the filling of life-saving apparatus (buoys, etc.), as it possesses a wonderful degree of buoyancy. The best existing glue is made of reindeer horns.

On the same basis Alaska, with its capacity for 9,200,000 head of reindeer, can supply the markets of America with 500,000 carcasses of venison annually, together with tons of delicious hams and tongues, and the finest of leather.

Surely the creation of an industry worth from $83,000,000 to $100,000,000, where none now exists, is worth the attention of the American people.

Third. The perpetuation, multiplication, and civilization of the Eskimos of that region. The Eskimos are a hardy and docile race. Their children learn readily in the schools, and there is no reason why they

should not be made an important factor in the development of that land. The density of population in any section being largely dependent upon the quantity of the food supply, the increase of food supply will naturally increase the number of hardy Eskimo.

For the breeding of the reindeer and the instruction of the native people in this industry, it is desirable that there should be a migration to that country of skilled herders and their families. The inviting of this class of European settlers will not crowd out the native Eskimos, but will greatly assist them in their efforts to adjust themselves to the raising of reindeer. Lapp families, with their greater intelligence, skill, and gentleness in handling reindeer, and their improved methods of treatment, wisely distributed among the Eskimos, will be an object lesson to stimulate, encourage, and instruct them.

To awaken an interest in Lapland and open the way for securing a larger number of Lapp herders, I would suggest the publication for distribution in Lapland of a small pamphlet in the Norwegian language upon the advantages of raising reindeer in Alaska.

I am in receipt of many applications for the reindeer report that can not be supplied, because of the limited edition now published. It is important that the rising public sentiment favorable to the introduction of domestic reindeer into Alaska should be fostered and quickened by the wide dissemination of the information contained in these annual reports. Judging from past experience, an edition of 100,000 copies would be quickly applied for and taken.

REINDEER FUND, 1894–95.

Received from Congress		$7,500.00
Disbursements:		
Supplies and general expenses of station, Port Clarence	$3,811.83	
Trade goods used in purchasing deer	1,767.26	
Extra coal used by the *Bear* in transporting deer	1,081.50	
Maps used in report	150.00	
Salaries of employees at station	683.80	
Total		7,494.39
Balance		5.61

I desire to acknowledge my indebtedness to Mr. John P. Haines, president of the American Society for the Prevention of Cruelty to Animals, for illustrations of driving and loading reindeer, and to Messrs. William Hamilton, Tappan Adney, John M. Justice, Francis Barnum, Winter & Pond, and to the Woman's American Baptist Home Missionary Society for photographs.

Thanking you for your deep interest and hearty cooperation in the work, I remain, with great respect,

Your obedient servant,

SHELDON JACKSON,
United States General Agent of Education in Alaska.

Hon. W. T. HARRIS, LL. D.,
Commissioner of Education, Washington, D. C.

Rear of cooper shop. Parsonage. Hospital.

A BIT OF THE PRESBYTERIAN MISSION, SITKA, ALASKA.

APPENDIXES.

NATIVE THLINGET FAMILY, JUNEAU, ALASKA.

APPENDIX A.

THE ITINERARY FOR 1895.

By WILLIAM HAMILTON, Assistant Agent of Education.

BUREAU OF EDUCATION, ALASKA DIVISION,
Washington, D. C., December 31, 1895.

DEAR SIR: In accordance with your instructions I left Washington on April 15, arriving at Tacoma six days later. Here I took passage for Sitka on the Pacific Coast Steamship Company's vessel *City of Topeka.* The low rates to Alaska during the present season, the alleged rapid development of the gold mines in the Yukon region, and the unusually hard times on the Pacific Coast are greatly encouraging immigration to Alaska. The *City of Topeka* was crowded from stem to stern with all sorts and conditions of men; every berth was occupied, and at night the tables in the dining saloon were covered with long rows of slumbering humanity.

Soon after crossing the line between British Columbia and Alaska the steamer touched at Metlakahtla, the home of Mr. Duncan's colony of Christianized Timpseans. There are about 100 neat frame houses in the village, a large church and schoolhouse, the boys and the girls' boarding home, Mr. Duncan's residence and office, the cannery, sawmill, and the store. The church is complete with belfry, spire, vestibule, gallery, and pulpit carved by hand, all native handiwork. The salmon cannery ships about 8,000 cases each year, and the sawmill supplies all the lumber needed. Sidewalks in excellent condition, 10 feet wide, extend along the principal street of the village. A conspicuous object is a platform built on a huge cedar stump, where the native band plays on steamer days. As the steamer arrived late in the evening and left at 4 o'clock the next morning, I regret that I did not see the school in session.

The next place of interest at which the steamer stopped was Fort Wrangell. In the days when the Cassiar gold mines at the head of the Stikine River were in their glory, and when the barracks were occupied by United States troops, a tide of motley life swept through the long street which extends along the water front from the fort to the chief's house. In 1877 the Government withdrew its troops from all posts in Alaska, the mining regions of the Stikine have been abandoned, and the only indication of the industry of civilization is the frequent puffs of steam issuing from the large sawmill.

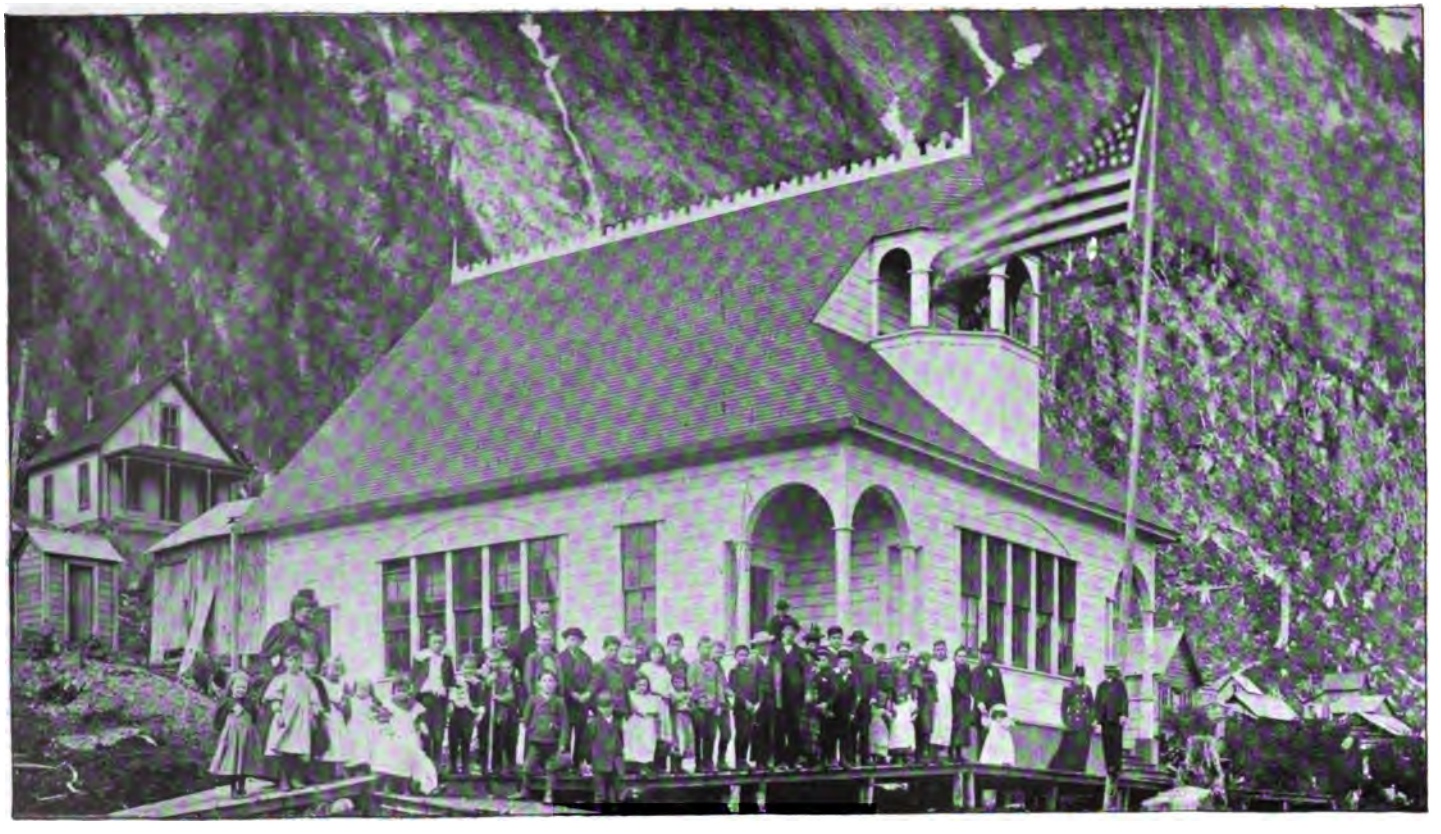
Mr. William A. Kelly, the local superintendent of schools for the Sitka district, lives in this village, and the public school for native children, held in the building which once was the hospital of the barracks, is in a very satisfactory condition under the care of Miss A. R. Kelsey.

On April 28 we found ourselves at the town of Juneau, which nestles at the base of a towering mountain. It is the largest town in the Territory and has a population of about 2,000, which number is largely increased when the miners from the neighboring regions winter there and also in the spring when newcomers tarry to purchase outfits and supplies before going into the interior. Juneau is the commercial metropolis of Alaska, and there is considerable rivalry between it and Sitka, the historic capital of the Territory; it has a court-house, jail, hotels, and lodging houses, two Government schools—one for white and the other for native children—a Presbyterian mission home and two churches (white and native), Russo-Greek church, also a Roman Catholic church, school, and hospital, opera house, bank, two weekly newspapers, fire brigade, and electric light and telephone plants.

Since my last visit to Juneau, in 1892, a new schoolhouse for natives has been built and the schoolhouse for white children has been thoroughly renovated, and both buildings compare very favorably with schoolhouses in places with the same population as Juneau anywhere in the United States. Mr. E. Keller has charge of the school for white children and Miss S. A. Saxman of the native school.

On the opposite side of Gastineau Channel, 2 miles from Juneau, is the town of Douglas, where is located the well-known Treadwell gold mine. Over $800,000 have been spent upon this plant since 1881. Its stamping mill, where the gold-bearing quartz is pulverized, contains 240 stamps, and is the largest mill of its kind in the world. The gold is shipped to the mint at San Francisco in the form of bricks worth several thousand dollars each. During the year ending May 31, 1894, 240,000 tons of ore were treated, yielding $768,000, or $3.20 per ton. In the village are two public schools. The one for white children is taught by Mr. L. A. Jones and the school for native children is under the care of Miss F. J. Work. The majority of the children in the school for natives are inmates of the home maintained here by the Kansas Yearly Meeting of Friends.

From Douglas the vessel steamed up Lynn Canal to Dyea at the head of the Chilkoot Inlet. This was the first time that the *Topeka* had ever been to the head of the inlet, and she felt her way along very cautiously. After careful sounding we anchored at about 6.30 p. m. Around us were magnificent snow-capped mountains, and just opposite a noisy waterfall leaped headlong down the face of the cliff. The pilot said that he would use it as a landmark for anchorage in the future. Men who enter the mining regions of the Yukon from the headwaters of the river take the trail which leaves tidewater at the head of this



JUNEAU, ALASKA, PUBLIC SCHOOL.
Photograph by Winter & Pond. (Copyright.)

inlet. We had on board 14 horses, which were to be used in carrying supplies over the mountain pass. These animals were now brought up from below. As the water shoals very rapidly toward the head of the bay, the *Topeka* had anchored a couple of miles from shore, and the horses had a long distance to swim. By this time it was dark and the struggles of the animals churned the chilly waters into displays of phosphorescent light.

On May 3 we touched at Killisnoo. A public school was maintained here for a number of years. In February, 1893, the schoolhouse was destroyed by fire, and the Bureau of Education has not been able to rebuild it, owing to heavy reductions in the Congressional appropriation for education in Alaska. Most of the children in the village attend the school of the Russo-Greek Church.

The Alaskan Oil and Guano Company, which is engaged in packing herring and manufacturing oil and fertilizer, has its works at this place. The annual product of their factory is 1,000 barrels of salted herring, about 400,000 gallons of herring oil, and 1,000 tons of fertilizer (composed of the refuse of the fish dried and pulverized, for which a market is found in California and in the Sandwich Islands, where it enriches the soil of the sugar plantations). In making the barrels Alaskan timber is used exclusively.

On May 1 the *Topeka* threaded its way into the beautiful island-studded harbor of Sitka, the seat of government of the Territory. Shielded on the one side by a majestic range of snow-capped mountains, and on the other protected from the swell of the Pacific by numerous thickly wooded islands, the town lies clustered along the curving sweep of the beach. As we face the town, a prominent feature in the foreground is the hill upon which Baranof Castle stood before the flames destroyed it in 1894. Extending along the beach to the right of Castle Hill is the section of the town inhabited by the white people. Above the dark roofs appear the green dome and Byzantine spire of the Greek Church. On the extreme right, near Indian River, is the group of buildings of the Presbyterian Industrial School. To the left of Castle Hill is the native village, consisting of neat frame houses, some of them with pretentious bay windows.

In 1890 Sitka had a population of 1,188, composed of 289 whites, 859 natives, and 31 Chinese. It has two public schools, a school and orphanage maintained by the Russian Government, and the large and successful Presbyterian Industrial School, with its boarding houses, hospitals, blacksmith shop, carpenter shop, shoemaking shop, paint shop, bakery, and steam laundry.

The few hours in Sitka were busily spent in inspecting the public schools (Miss Patton and Mrs. Knapp, teachers) and in visiting the schoolroom and industrial shops at the Presbyterian mission.

On May 1 I took passage on the mail steamer *Dora* for Unalaska, 1,250 miles west of Sitka, on one of the Aleutian Islands of the same

name. This mail route is in operation from the 1st of April until the 31st of October of each year. During the winter months Sitka is the limit of mail communication. Threading her way westward among the green islets the trim little *Dora* soon left the smooth, landlocked waters and encountered the unchecked sweep of the Pacific Ocean. From Sitka westward the character of the scenery changes. The narrow water-lanes hemmed in by the thickly wooded islands of the Alexander Archipelago give place to the untrammeled ocean beating against the bases of the barren cliffs and mountain ranges of "continental Alaska."

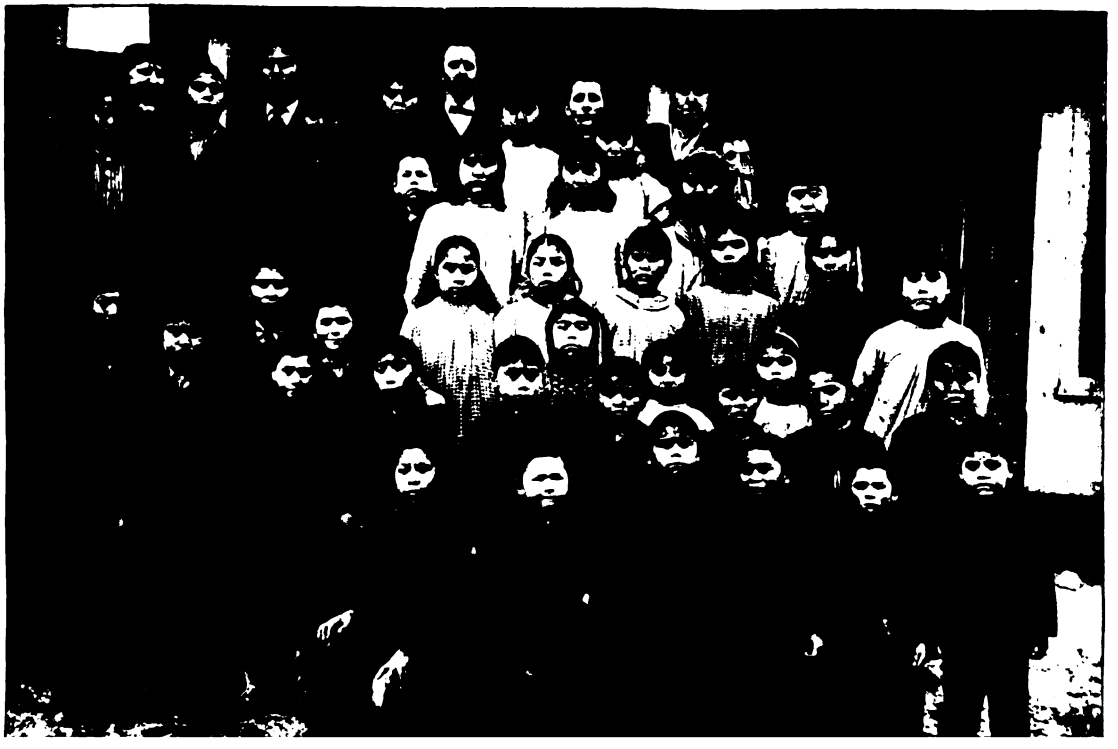
The morning of May 3 found us in Yakutat Bay. Here, near the base of Mount St. Elias, is a mission station of the Swedish Evangelical Church, with the Rev. and Mrs. Albin Johnson, Rev. K. J. Hendrickson, and Miss Selma Peterson as teachers. Mrs. Johnson came from Jankaping, Sweden, making a journey of 9,000 miles to join Mr. Johnson. Landing through the surf, we picked our way along the beach to the mission buildings. In the winter of 1892–93 one of the large and substantial boarding houses was burned. The undaunted missionaries commenced rebuilding it, and at the time of our visit it was nearly completed. The other building is a model of neatness, and there is an air of unassuming sincerity and thoroughness about the whole place.

In 1880 gold was discovered in the black sand of the beaches surrounding Yakutat Bay, and from that time until 1888, when a tidal wave washed most of the sand away, numerous mining camps dotted its shores. The black sand is accumulating once more, and prospectors have also returned. It is said that good coal has been found about 2 miles inland, but as Yakutat Bay is only a slight indentation of the coast into which the unbroken force of the North Pacific sweeps, loading ships with coal in that bay would be an undertaking of great difficulty.

The Yakutats are the northernmost branch of the Thlinget race, which inhabits southeast Alaska. Like the rest of the Thlingets, and also the Aleuts, they are expert basket weavers; in some of the houses we saw magnificent robes made of down from the breast of the eagle.

During the afternoon the clouds lifted, revealing the St. Elias Alps, and during the remaining hours of daylight we skirted the 60-mile front of the Malaspina glacier, with the sea dashing against its ice cliffs. The unbroken sweep of mountain scenery from the St. Elias range to the Aleutian chain is unsurpassed in gloomy grandeur. At the little trading post of Kayak we took on board a man who had just spent seven months as keeper of a fox ranch on one of the neighboring islands. For that length of time he had not seen a human face, his sole company being the foxes.

On evening of May 4 we entered the land-locked harbor of Nuchek, or Port Etches, at the entrance of Prince William Sound. At Snug



Corner Bay in this sound Captain Cook repaired his ships in 1778, and here in 1783 Baranoff built the ships in which he made his first expedition to Sitka. A more sheltered harbor could hardly be imagined. In 1892 the Victoria sealing fleet rendezvoused at Nuchek to meet their supply vessel, the *Coquitlam*. The revenue-cutter *Corwin*, Capt. C. L. Hooper commanding, surprised them in the act of transferring the cargoes of seal skins, and the *Coquitlam* was seized and taken to Sitka for a violation of the United States revenue laws in transferring cargo without authority. At Nuchek there is a salmon cannery and trading post. Here the Russo-Greek Church maintains a school with an enrollment of 37, Mr. Andrew P. Kashevaroff, teacher.

The next morning we steamed up the sound to the little settlement of Taklitat. At the very head of the sound the two branches of the Chugak Alps meet and their snowy sides are perfectly mirrored in the glassy waters. In this out-of-the-way nook the Alaska Commercial Company has a trading post. The trader and almost the entire population of the village were suffering from la grippe. The mail steamer carries a supply of medicines, and an exceedingly formidable quantity of "grip mixture" was left with the trader.

Our next port was St. Paul (Kadiak), on the northeast shore of Kadiak Island. The harbor of St. Paul is encircled by undulating hills and the village nestles among gentle slopes of grass and moss. The climate of this region is mild; cattle are raised and small gardens are numerous. In 1874 a delegation from the Scandinavian residents of Wisconsin made an expedition to this region to determine whether it would be advantageous for their people to seek homes on this island. From their report the following sentences are taken:

> Potatoes grow and do well, although the natives have not the slightest idea of how they should be cultivated, which goes to show that they would thrive excellently if properly cared for. To judge from the soil and climate, there is no reason why everything that succeeds in Scotland should not succeed at Kadiak. Pasture land is so excellent on the island, and the hay harvest so abundant, that our countrymen would here, just as in Iceland, make sheep breeding and cattle raising their chief method of livelihood. The quality of the grass is such that the milk, the beef, and mutton must be excellent; and we had also an opportunity to try these at Kadiak.

On Kadiak Island the dense dark forests dwindle in scattered groves, and from this point westward even these disappear. The sides of the Aleutian Mountains are entirely void of trees. In the summer months, after the snow has disappeared, the shrubs, the grasses, and mosses which cover them are kept intensely green by the almost perpetual fogs and showers. The dugout disappears with the forests, and its place is taken by the bidarka, a narrow canoe of sea lion or walrus hide tightly stretched over frames of driftwood. It has two, sometimes three circular hatches, just large enough to admit a man's body. The hatches are usually furnished with an apron which is fastened around the waist so that the bidarka becomes perfectly water-tight. These "Cossacks of the seas," as Lütke called them, buoyantly ride the roughest waters.

Captain Billings wrote of them, "If perfect symmetry, smoothness, and proportion constitute beauty, they are beautiful beyond anything that I ever beheld."

At Kadiak in 1784 the Russian Gregory Shelikoff formed a settlement and commenced the subjugation of the people. The first school in Alaska was organized at this place, and here the first church building was erected. For a long time it was the Russian capital of Alaska. Kadiak is the headquarters of the Alaska Commercial Company for the district comprising Cook's Inlet and Prince William Sound, and furs to the value of $300,000 are shipped yearly. Here the Bureau of Education has an excellent public school, Mr. C. C. Solter teacher. I attended sessions of the school, and have no hesitation in saying that the children are just as far advanced as children of the same age in any village school in the country. I had a satisfactory interview with the members of the local school committee, who here, as elsewhere in the Territory, aid the Bureau of Education with suggestions, and several improvements to the school property were authorized. The priest of the Russo-Greek Church, under whose spiritual care are most of the children, was present.

Near Kadiak Island is Wood Island. Here the Baptist Woman's Home Mission Society has begun a noble work for the rescuing of the waifs and destitute children of that region by maintaining a home. The condition of some of the poorer native children was thus described by Mr. W. E. Roscoe, in charge of the home, formerly teacher at Kadiak:

> In every settlement through this part of the country may be found poor, defenseless children clothed only in rags, with no one to provide suitable food or clothing, and living entirely upon such charity as may be found among a heathen people. There are many destitute children, made so by the drunkenness and the vagabond character of their parents. In the Aleut settlement of Afognak, the natives have sold the bedding from their huts to obtain the vile stuff. The winter is upon them, and until recently they have been so demoralized with liquor that they had not laid in the usual winter's supply of dried fish—their main subsistence. Now, the future of this race is that they will perish from off the face of the globe unless they are Christianized, and that soon. It is a fact that the children do not generally show this terrible craving for strong drink. The pupils of my school are ashamed of their parents' drinking. It is only right and just that our Government take orphan children and inebriates' children and put them in a good industrial school under religious teachers, who, in addition to moral and intellectual training, will teach them the cultivation of the soil, the rearing of cattle, sheep, hogs, and poultry, the elements of some of the mechanical arts, and the girls the arts of sewing and of cooking.

In the hospital on Wood Island were seven men who had been saved from the wreck of the schooner *White*, which was driven ashore at the south end of Kadiak Island in a severe storm on April 13. Eleven of the crew had perished in the icy waters and several of the survivors had been so terribly frostbitten that they would be maimed for life.

Kadiak Island is separated from the mainland by the wide Shelikoff Strait. According to the native legend this was once a narrow chan-

Mrs. Coe. Miss L. Goodchild. Rev. C. P. Coe.

BAPTIST TEACHERS. WOOD ISLAND.

BAPTIST MISSION PUPILS, WOOD ISLAND, ALASKA.

nel. A huge otter attempted to swim through and was caught fast; in his struggles he widened the strait and pushed the island out to its present position.

On the afternoon of May 8 we lay-to off the village of Karluk. There is no harbor here; vessels anchor in the open roadstead and landings are made in boats. The breeze had freshened, a high sea was running, and it was too rough for us to land. A Government school was maintained here for a few years, but a reduction of the Congressional appropriation for education in Alaska rendered necessary a curtailing of expenses and the school was closed in 1892. A teacher has been appointed who will reopen it in the fall of 1895.

The Karluk River, 16 miles long and about 6 feet deep, is one of the most remarkable salmon streams in the world. Beside its shallow waters are located several large canneries where, according to the census report of 1890, about 300,000 cases of salmon were packed. The employees number over 2,000, and in the summer months the Chinese, Italians, Greeks, Portuguese, and Americans constitute one of the most heterogeneous communities under the American flag. The United States commissioner at Unalaska, 700 miles away, is the nearest representative of the authority of the United States. On May 9, as the gale had increased, the captain very considerately ran into a small bay near Cape Providence and remained there until the gale had spent its force.

Unga was reached at 4 a. m. on the 11th. Here I had an opportunity of going ashore and meeting the teacher, Mr. McKinney, and of inspecting the school buildings. Near the village of Unga is the mining property of the Apollo Consolidated Mining Company. By skillful management and wise expenditure of money the mine is being operated with large profit. Two thousand five hundred feet of tunnels have been completed; waterworks, steam compressor, offices, and dwelling houses have been built. The forty-stamp mill is producing monthly $30,000 worth of gold.

Just south of the Shumagin Islands, upon which Unga is located, are immense cod banks whose value is just beginning to be appreciated. They were first reported by Professor Davidson in 1867. Since that time the United States Fish Commission steamer *Albatross* has done a great deal of sounding and mapping of the banks. The value of the Shumagin catch of cod in 1890 was $500,000. As the fur seal decrease it is asserted that the cod-fishing industry will greatly increase, as it is said that one seal will in a season consume cod equal in value to the price of a raw seal skin.

At 9 a. m. we were under way, and at 10.30 came to anchor at Sand Point. Under the wharf and forming its foundation is the wreck of the *John Hancock*. She was built at the Charlestown Navy-Yard in 1842, and was in Commodore Perry's Japan expedition in 1853-54. Shortly afterwards she was condemned and sold into the merchant service.

Her machinery was taken out and she was converted into a three masted schooner. While in the merchant service as a lumber vessel she was abandoned at sea off the coast of Oregon. Being recovered and brought into port, she was bought by Messrs. Lynde & Hough, of San Francisco, who used her in their codfish trade. On March 7, 1893, a heavy southwester dashed her upon the rocks at Sand Point, her final resting place. Sand Point consists of a few houses belonging to Messrs. Lynde & Hough, a hotel, and United States custom-house. Going ashore I made the acquaintance of Mr. J. H. Bugbee, the agent, and with him selected a sight for a schoolhouse.

On the morning of May 12, feeling our way along, the fog horn sounding, we turned north in the mists of Bering Sea through Unimak Pass, in the Aleutian chain, whose seventy islands stretch for a thousand miles like gigantic stepping stones toward Siberia. Attou, the westernmost limit of the land possessions of the United States, is beyond the one hundred and eightieth meridian and within the Eastern Hemisphere. Soon the fog lifted and we steamed through waters as smooth as a mill pond. Bold headlands, towering pinnacles of rock, mountain slopes carpeted with mosses whose intense green was heightened by great patches of snow here and there; volcanoes draped with cloud and plumed with smoke delighted the eye as we glided along. In a few hours we swept past Priest's Rock, an outlying pinnacle which bears a resemblance to a priest of the Greek Church in his robes, and entered Unalaska Bay. Twelve miles up the bay is the village of Unalaska or Iliuliuk (the curving beach), the commercial center of western Alaska. It is the port of entry for Bering Sea. A deputy collector of customs, deputy marshal, and a United States commissioner reside here. At Unalaska are the headquarters of the Alaska Commercial Company for the western and arctic regions of the Territory. At the neighboring village of Dutch Harbor are the offices of the North American Commercial Company, also controlling trading posts scattered over thousands of miles of territory. During the summer months Unalaska is the rendezvous for all the shipping in that part of the world. The ships of the arctic whaling fleet call here for coal, water, supplies, and mail, and to leave news of the movements of the arctic ice and the catch of whales, and receive tidings of the great world to the south. Since 1891 it has been the headquarters of the United States and British fleets engaged in the Bering Sea patrol.

In the vast territory tributary to Unalaska are numerous waifs, many of them the children of white men. Here at Unalaska the Methodist Woman's Home Mission Society in 1889 entered upon the noble work of taking these poor children out of their squalor and mental darkness, and by surrounding them with the influences of a Christian home to lift them into a higher civilization. From a beginning with two orphan waifs from the island of Attou, 1,000 miles west of Unalaska, the home family had increased in June, 1895, to about thirty, and the transfor-

mation that careful, conscientious training had wrought in the children was marvelous. While waiting to join the United States revenue-cutter *Bear* in its arctic cruise I became intimately acquainted with the work being done in the home under the supervision of Mr. and Mrs. Tuck, and I have no hesitation in saying that a neater, more intelligent, well-behaved set of children it would be hard to find anywhere in the country. In the schoolroom, which I visited repeatedly, I found that good progress had been made in the acquisition of the English language. Those children who had been in the home for three years or more not only read, wrote, and spoke, but also seemed to do their thinking in English. From its commencement in 1889 until the past summer the home has been maintained in a small one and one-half story rented cottage. During the summer a commodious boarding house was erected.

The Aleutian Islands are so remote, so little is generally known of them, to the visitor they have such an air of primeval solitude that one finds it difficult to realize that they have been the theater of stirring events and have a history extending back one hundred and fifty years. No notice of this region would be complete without at least a glance at this history. I quote the following résumé from Dr. Sheldon Jackson's report for 1890:

The discovery of these islands by Europeans is due to the unbounded ambition of Peter the Great, of Russia, who, having founded a Russian Empire in Europe and Asia, would also found one in America. The western coast of America had been explored as far as Cape Mendocino, California, but from California north it was a vast, unknown region—"the great northern mystery, with its Anian strait and silver mountains and divers other fabulous tales." To solve these mysteries, to determine whether Asia had land communication with America, to learn what lands and people were beyond his possessions on the eastern coast of Siberia, Peter the Great, in 1724, ordered two expeditions of exploration and placed them both under the command of Vitus Bering, a Dane in the Russian service. The expedition set out overland through Siberia on January 28, 1725, under Lieutenant Chirikoff. Three days later the Emperor died, but the expeditions were energetically pushed by his widow and daughter. The first expedition, from 1725 to 1730, explored Bering Strait, and settled the question of separation between Asia and America.

The second expedition was fitted out by the Empress Catherine, and consisted of two vessels, the *St. Paul*, commanded by Bering himself, and the *St. Peter*, in charge of Alexei Ilich Chirikoff, second in command. The expedition was accompanied by several scientists and sailed from Avatcha Bay, Kamtschatka, on June 4, 1741. This ill-fated expedition discovered the mainland of Alaska and the Aleutian Islands. But the remnant that brought back the news of the discovery of northwestern America also brought with them the beautiful furs of the sea otter, and wide-awake merchants were not slow to see their opportunity. As the adventurous hunt for the little sable had led the hardy Cossack and extended Russian dominion from the Ural Mountains across Asia to Kamtschatka and Bering Sea, so now the hunt for the sea otter was to extend Russian settlement 2,000 miles along the coast of America. A few months after the return of Bering's expedition in the spring of 1743, Emilian Bassof formed a partnership with a wealthy Moscow merchant, built a small vessel named the *Kapiton*, and commenced the fur trade of the newly discovered islands. On his second trip in 1745 he collected 1,600 sea otters, 2,000 fur seals, and 2,000 blue Arctic foxes. This was the commencement on the part of the merchants of Siberia of a mad race after the furs of Alaska—a race so mad that they could not wait the

securing of proper materials for the building of safe vessels and the procuring of trained seamen. Boats were hastily constructed of planks fastened together with rawhide or seal-skin thongs. In these unseaworthy boats, without charts or compass, they boldly ventured to sea, and the half of them found a watery grave. Those who did return in safety with a fair cargo received from 2,000 to 3,000 rubles each as their share of the profit.

On the 26th of September, 1745, for the first time the discharge of firearms was heard on the Aleutian Islands. A native was shot on the island of Agoto by a party of Russians under Chuprof. Then commenced a reign of lust, robbery, and bloodshed, which lasted for fifty years. One Feodor Solovief is reported to have alone killed 3,000 Aleuts. Veniaminof, who was the leading Greek priest and first bishop of Alaska, declares that during that dreadful period Aleuts were used as targets for Russian practice in firing. In 1764 Captain Solovief formed a settlement. His stay on the island was marked by such bloody atrocities that the few who survived were completely subjugated. His name has come through a hundred years of local tradition as the synonym of cruelty. Among other things it is said that he experimented upon the penetrative power of his bullets by binding twelve Aleuts in a row and then firing through them at short range. The bullet stopped at the ninth man. In 1770, when the American colonists were preparing themselves for the struggle for independence, the struggle of the Aleuts was ending. They had given their lives in vain. The few who were left could no longer maintain the unequal conflict and were reduced to practical slavery.

During the first week of June the fleet of vessels which was to patrol Bering Sea rendezvoused at Unalaska. Officers and sailors gave life to the hitherto deserted street, dainty revenue cutters and a trimly built British gunboat rode at anchor in the harbor; saucy little steam launches and natty, white boats darted about; bugle calls floated out over the tranquil waters, now and then jets of flame and columns of smoke would shoot from the side of some vessel at target practice and a spurt of dust on the mountain side show where the shot had struck. All was life and action, where there had been silence and stagnation. There were calls upon the officers of the various ships, photographic excursions, climbing of mountains whose ravines still held the winter snows, balls, and even a wedding at high noon in which the contracting parties were Miss Short, who had been the public-school teacher at Unalaska during the past year, and Mr. Hastings, one of the agents of the Alaska Commercial Company.

On the 10th of June the United States revenue cutter *Bear* steamed into the harbor. On this famous vessel I was to spend the summer among the ships of the Arctic whaling fleet, to cruise in uncharted seas whose waters are disturbed only by the skin canoes of the natives and by huge ice floes, to visit the school teachers and missionaries exiled on the shores of the frozen ocean, and see the underground dwellers in the Land of the Midnight Sun and the long Arctic night.

The annual cruise of the *Bear* is unique in its multifarious duties and its practical usefulness. In northern Bering Sea and in the Arctic Ocean, and along vast stretches of coast unknown to civilization, the flag of the *Bear* is the only evidence of the authority of the United

States ever seen. Leaving San Francisco in spring, during the early part of the cruise she patrols the North Pacific, enforcing the regulations with regard to sealing, also preventing smuggling and exercising a salutary influence generally along the southern shore of the mainland of Alaska and the Aleutian Islands. Later in the season when the ice retreats before the summer heat, she turns northward into Bering Sea and the Arctic Ocean. In these waters, in addition to performing the ordinary duties of a revenue cutter, protecting the interests of the customs and preventing smuggling, she furnishes relief to the ships of the arctic whaling fleet and all other vessels in times of peril and disaster. During the past fifteen years she has rescued and taken from the bleak and sterile coast of western and arctic Alaska more than a thousand shipwrecked mariners and destitute miners. She collects all possible geographical, ethnological, and scientific information; she affords protection when needed to thousands of half-civilized natives, whalers, traders, teachers, and missionaries, and to anyone in distress; to her captain, as the sole representative of the authority of the United States, are referred troubles between whaling captains and their crews, and his advice is sought on all subjects; her surgeon furnishes the only medical attendance which white men and natives along thousands of miles of coast ever receive; most of the mission houses and school buildings in the Arctic were erected with the aid of her carpenter; during the past five years her usefulness has been still further increased by cooperating with the Bureau of Education in procuring and transporting reindeer from Siberia into Alaska. Since 1884 her commanding officer has been Capt. Michael A. Healy, and the ability, zeal, and faithfulness with which he has discharged his multifarious duties has rendered his name famous throughout the land.

During the entire cruise I was fortunate in having as my shipmates in the captain's cabin Dr. Benjamin Sharp, secretary of the Academy of Natural Sciences of Philadelphia, and his friend, Mr. John M. Justice, also of Philadelphia.

Leaving the wharf at Dutch Harbor, Unalaska, on June 24, the *Bear* headed for the seal islands, St. Paul and St. George, lying 250 miles to the north.

In 1786, when the supply of furs upon the Aleutian Islands began to decrease, efforts were made to discover the summer retreat of the seal. For years it had been noticed that they went north in the spring and returned in the fall with their young, but so well had nature hidden these islands that the Russian Gerassim Gavrilovich Pribilof cruised around them for three weeks in his vessel *St. George* without discovering them. At last the fog lifted and their green shores and rocks covered with seal were sighted. Soon the islands became the "bank" which supplied Baranof with funds to carry on his government in Alaska. If he needed supplies for his colonies, all he had to do was to kill seal and pay in seal skins. In order that the seal might not be

exterminated, in 1805 the Russian Government prohibited their killing for a period of five years, and the rookeries regained their numbers. For a few years after the transfer of Alaska to the United States indiscriminate slaughter of the seals was carried on by seven different firms.

In 1869 the islands were declared a Government reservation, and a company of soldiers stationed on them. In 1870 the seal fisheries were leased for twenty years to the Alaska Commercial Company, of San Francisco, at an annual rental of $55,000 and a tax of $2.62½ on each skin. In 1890, at the expiration of their lease, the Alaska Commercial Company had paid into the Treasury of the United States $5,956,565.67. Since 1890 the lease of these fisheries has been held by the North American Commercial Company, also of San Francisco, at an annual rental of $100,000 and a tax of $9.62 on each seal. Pelagic sealing and rookery raiding have so diminished the numbers of the seals that 20,000 skins is now the average number killed by the company each season.

On June 25 we sighted the fog-wreathed cliffs of St. George, but a heavy sea was running, the fog became thicker as we approached the island, and it was not considered safe to attempt to make a landing. The same evening we were in the vicinity of St. Paul, but by this time the fog had become even more dense, and the visit to these famous islands had to be deferred until our return in the fall. Accordingly, the *Bear* shaped her course for St. Lawrence Island, the largest body of land in Bering Sea.

In the bright, clear sunshine of June 26, over seas as smooth as glass, we glided past barren St. Matthew's Island, a famous home of bears, with its massive Cape Upright and towering Pinnacle Rock. On June 28 the anchor was dropped off the north side of the village on St. Lawrence Island. A high sea was running, and a long line of angry white breakers dashing upon the icy beach formed a barrier to the crowds of natives whom we could see walking along the shore waiting for a chance to launch their canoes and come to the ship. Among them we could distinguish Mr. and Mrs. Gambell, the teachers who have just completed their first year among these half-civilized people, the only white persons on the island, with no communication with the outside world for eight or nine months of the year. Soon huge cakes of ice came drifting down toward us; the anchor was weighed and the vessel steamed over to a more sheltered position on the south side of the sand spit upon which the village is built. As soon as the anchor was dropped, a flotilla of oomiaks was alongside, and the St. Lawrence Islanders flocked on board, stalwart fellows with dark, tattooed faces and tonsured heads, like so many very dirty but exceedingly good-natured monks, with massive shoulders developed by almost constant use of the paddle, dressed in suits of reindeer fur or hair seal. Some of them wore summer suits of drilling and the poorer ones had shirts constructed of flour bags with the inscription "Franklin Mills

REV. AND MRS. THOMAS HANNA, CONGREGATIONAL TEACHERS, CAPE PRINCE OF WALES, ALASKA.

MR. AND MRS. V. C. GAMBELL, PRESBYTERIAN TEACHERS, SAINT LAWRENCE ISLAND, BERING SEA.

Flour" very much in evidence. Soon the decks were swarming with them, and there was bartering of fox skins, ivory, and curios for powder, lead, flour, tobacco, drilling, matches, and other useful articles.

The Alaskan Eskimo and the Siberian seem to care nothing for articles so frivolous as beads and looking-glasses; their struggle for life in their barren, sterile environment has rendered them intensely practical in their desires. Mr. and Mrs. Gambell came into the cabin and spent a few hours receiving and giving the news of a year. Although exiled from civilization, the first teachers among a hitherto primitive people, they have been happy and contented, and are in the best of health and spirits. The school has an enrollment of 52. In the afternoon several of us descended into one of the larger canoes, and were paddled ashore by a chattering, gesticulating crowd. Landing through the surf on an icy beach from an unsteady oomiak whose bottom gives when you tread on it is distinctly an achievement. When we entered the foaming surf several of the most stalwart men leaped into the boiling waters, seized the thwarts of the oomiak, and, with loud shouts, dragged it beyond the reach of the breakers. The excited gesticulations of these islanders in fur, their loud cries, the seething waters churning the ice and gravel of the beach formed a scene of animation never to be forgotten. Snatching up camera cases and tripods, clambering over natives, seats, and paddles that seemed to be everywhere, we passengers scrambled our way to the prow and made wild leaps for terra firma. Over heaps of gravel with ice beneath it we made our way to the schoolhouse and cosy home of the Gambells. Then, escorted by a throng of bright-looking natives and equally numerous dogs, we strolled through the village, taking several photographs. The village contains 32 houses or tents of deerskin and has a population of 332.

At 8.40 next morning we weighed anchor and headed for Indian Point, Siberia, about 40 miles distant. In a few hours land was sighted on the starboard bow—sharply defined peaks projecting above the low-lying mists, and as we drew nearer, the clustering deerskin tents that form the Tuchtchee village of Indian Point came into view. As usual, almost the entire population came on board. Prominent among them was Koharri, the most influential native in that region. He has a little frame house, filled from floor to ceiling with tobacco, flour, and looking-glasses, which he has obtained from the whalers, and from which he supplies the country for miles around. This man has been known to have as much as $75,000 worth of whalebone in his storehouse at one time. He does a business of probably $100,000 a year, and yet not a single bank note or bank check is used, nor are any books kept. All transactions are by barter—furs and whalebone being exchanged for tobacco, flour, and whisky. This wholesale merchant of the North Siberian coast can neither read nor write, nor can anyone associated with him. Although so wealthy, he lives in an ordinary tent and sleeps on the ground on a pile of deerskins. At this place

two Cossack officers were found taking the census of the village. This was the first visit of Russian officials to that section of the Siberian coast in many years, and the natives brought the Russian coins they had received from them over to the ship to sell as curios. Here, as elsewhere on the trip, the ship's surgeon went ashore to treat the sick.

Turning northward and coasting along the desolate, forbidding shore the vessel anchored July 1 off South Head, St. Lawrence Bay. Here Peter and Kimok, the leading men of that section, came on board, and in the pilot house a consultation was held as to the number of deer they were willing to sell this season. Forty deer were promised. The herd, however, was on the opposite side of the bay and could not be reached until the ice should go out a month later. Peter and Kimok were kept on board to serve as agents and interpreters in the reindeer trade during the season.

Kings' Island was sighted at 2 a. m. on July 2. It is a mass of basalt, about a mile in length, rising about 1,000 feet above the sea. Upon it is one of the most remarkable settlements in Alaska. The rocks rise perpendicularly from the ocean except on the south side, where a ravine rising at an angle of 45 degrees scars the cliff; on the side of the ravine is the village of about forty huts, partly excavated in the side of the hill and partly built up with stone walls. Across the top of these walls are large poles of driftwood, on which hides and grass are placed to form a roof. These are their winter residences. In making their summer homes they use the roof of the underground house as the floor and over it build a tent of walrus hide stretched over a wooden frame. These summer houses are guyed to the rocks with rawhide to prevent them from being blown off into the sea. On the opposite side of the ravine is a cave, into the mouth of which the sea dashes, and at the back of the cave is a bank of perpetual snow. On the side of the mountain above is a perpendicular shaft from 80 to 108 feet deep leading down to the snow in the cave, which is used as the village storehouse. Walrus and seal meat are dropped down the shaft and stored in the snow, were it keeps indefinitely. The women gain entrance into their cellar by letting themselves down hand over hand along a rawhide rope.

Leaving this hermit colony astern, the *Bear* headed for Point Spencer, at the entrance to Port Clarence, on whose shores the reindeer station is located. As we neared land, huge floes of drift ice were encountered; the officer of the deck went to the "crow's nest," and at slow speed the captain and the first officer carefully guided the vessel on her course. When the larger pieces of ice were struck, she would quiver for an instant from stem to stern like a thing of life. On rounding Point Spencer, the whaling fleet was seen riding at anchor with flags flying in honor of the arrival of the Government vessel. As the *Bear* neared each ship, flags were dipped and steam whistles pierced the quiet air. After cruising in deserted, ice-covered waters, the only craft

a skin canoe here and there, it was an inspiring sight in this far off, uninhabited bay, almost within the Arctic Circle. The whaling fleet usually leaves San Francisco in January, and it is their custom to gather at this point about the 1st of July before entering the Arctic Ocean to meet the steamer sent from San Francisco with a fresh supply of provisions and coal. Soon after anchoring, the captains of the whalers began arriving, in order to get their mail; for among other good offices the *Bear* brings up the annual mail for the whalers, traders, teachers, and others in the Arctic regions of the United States. Great bundles of letters and papers were piled on the captain's table, which were carefully scanned, each man picking out those that belonged to himself or his crew. Among the visitors were Mr. Kjellmann and Mr. Brevig, from the reindeer station 10 miles away, who brought the news of the successful wintering of the herds. I spent July 3 inspecting the station. As the affairs of the station are treated in detail elsewhere in this report, I shall not dwell on them.

On the morning of the Fourth of July all vessels dressed ship in honor of the day. A baseball game on shore, a salute of twenty-one guns at noon, and a dinner on the *Bear* to the whaling captains comprised the public celebration of the day.

At 2 a. m. July 5 we were under way and turned southward toward St. Michael. Norton Sound, through which we cruised, is tinged with the flood of fresh water which the Yukon empties into the sea 60 miles south of St. Michael, and on its surface float masses of driftwood brought down from the interior. As we approached the settlement we met the Alaska Commercial Company's steamer *Bertha* coming out to search for an overdue brig, which was bringing supplies for the company's post at St. Michael and also for its stations farther up the river. At 2.30 the *Bear* anchored in the stream about 3 miles from shore, being unable to approach nearer on account of the shoals.

St. Michael is located on the first good site for a trading post north of the delta of the Yukon, and is the outlet of the Yukon trade, and also the base of supplies for the country bordering on the river and its many gold-bearing tributaries. The village consists of the offices and warehouses of the Alaska Commercial Company, the houses of their white employees, and a small native settlement. The trading post was established by the Russians in 1835. A blockhouse and several of the original buildings are still standing. During our visit the population was considerably augmented by the presence of a party of missionaries who were waiting here for the arrival of the small, light-draft, stern-wheel steamer which would convey them to their destinations up the river. It is said that one of the missionaries who is stationed 2,000 miles, more or less, up the river, when he saw his freight bill of $125 per ton for transportation from St. Michael to his station, added a very earnest petition in his prayer that freight might be reduced. At St. Michael I had the pleasure of renewing my acquaintance with the Rev.

and Mrs. J. L. Prevost, of the Episcopal mission of St. James, and of meeting Fathers Judge, Post, and O'Hare, of the Catholic missions.

On July 8 we again headed for Siberia, where it was expected that by this time the ice would have left the coast in the vicinity of St. Lawrence Bay. On our way we visited Sledge Island. The village is a cluster of hillocks, each with a square hole in the top, through which one descends into a chamber from 20 to 25 feet square and about 8 feet deep. At the corners and along the sides posts of driftwood had been placed. Other timbers across the top formed the roof. Against the sides dirt and sod were piled, making it proof against the intense cold, and also very successfully imprisoning the powerful odors of the seal and walrus meat that lay about in huge chunks. Light is admitted through the translucent bladder of a seal or walrus tightly stretched over a hole in the ceiling. Several of the houses were connected by underground tunnels. Excepting a few old women, the village was deserted, almost the entire population being sight-seeing on the *Bear*.

At East Cape, Siberia, on July 9, four or five influential natives were taken on board to aid in procuring reindeer. Learning that there was a large herd about 50 miles to the north, the vessel entered the Arctic Ocean. Early in the morning of July 11 the *Bear*, picking and forcing her way through the ice, reached the village of Utan, and there on the beach was the herd of deer. As soon as the anchor was lowered a boat was manned and steered carefully among the floes to shore. In order that the deer might be more easily kept together, they had been driven down to the beach, which was covered with ice and snow. On the bank above, however, the snow had disappeared and the ground was carpeted with moss and flowers—great patches of forget-me-nots and yellow poppies. Here, as elsewhere on the coast of arctic Alaska and Siberia, the profusion of wild flowers is surprising.

The herd numbered about 500, and seemed to be owned by about half a dozen men, each man's deer bearing his mark. The deer men are very expert in the use of the lasso, and had no difficulty in throwing the noose around the particular deer to be sold. As each one was caught it was brought down to the boat, its front and hind legs hobbled, and it was stowed in the bottom of the boat. When a load of about a dozen had been secured they were rowed over to the *Bear* and placed in stalls. Sixteen deer were secured at this place. Continuing the trip up the coast, the *Bear* tied up to a huge ice floe, near Cape Serdze, Siberia, and the interpreters were sent inland to bring more deer to the coast. While waiting we spent the time in taking photographs, exploring the neighboring coast, and visiting the native village. There were also some very successful ducking expeditions. The ice closing in, the *Bear* was compelled to move a few miles farther south, anchoring off Chacoran, where 22 deer were secured. In that latitude at that time of the year there was hardly any night, and on this occasion work commenced at 2 a. m., and it was 12.30 (midnight) before the

GROUP OF SIBERIAN REINDEER MEN, SAINT LAWRENCE BAY, SIBERIA.
Photograph by William Hamilton.

BRIG W. H. MEYER, WRECKED ON BEACH IN FRONT OF TELLER REINDEER STATION, 1895.
Photograph by J. M. Justice.

last deer man was paid off in barter goods. Anchor was weighed as soon as the oomiaks were clear of the ship, and the vessel once more got under way for Port Clarence. While we were crossing Bering Straits a heavy gale came up and several deer were badly injured by the rolling and pitching of the vessel. We did not reach Point Spencer until the 17th, and as the gale was still violent we anchored in the lee of the cape until it subsided.

About noon of the 20th the *Bear* steamed over to the reindeer station and landed the deer. The brig *W. H. Meyer*, with the annual supplies for several stations and schools on board, was found wrecked on the beach in front of the station, having gone ashore during the gale on the night of the 17th. The supplies for the station had fortunately all been landed, but those for the schools at Cape Prince of Wales and Point Barrow were lost. Mr. and Mrs. Hanna, who were to relieve Mr. and Mrs. Lopp at Cape Prince of Wales, had been passengers on the *Meyer*, and unfortunately their supplies had been so damaged as to be useless. They were heartily welcomed and cared for at the station.

On July 22 the *Bear* weighed anchor and headed for Siberia for another load of deer, and on July 23 reached St. Lawrence Bay. On the 24th she steamed to the head of the bay, where 43 head were secured. The next day she returned to the station and landed the deer. Mr. and Mrs. Kjellmann having decided to return to the States, it was possible to spare supplies for Mr. and Mrs. Hanna. By the courtesy of Captain Healey they were received on board and landed at Cape Prince of Wales on the afternoon of the 27th.

Cape Prince of Wales is the westernmost point of America, and is a bold promontory rendered remarkable by a number of jagged points upon its ridge. Here is the largest village on the American side, with a population of 539 Eskimos. This school has been remarkably successful, and I repeat a short sketch of it which has been printed in a previous report, but which may now reach a larger number of readers:

In 1890 the American Missionary Association (Congregational) established a station at this place, with Messrs. W. T. Lopp and H. R. Thornton as teachers; school was opened on the 18th of August, 1890, with only about one-fourth of the population returned to the village from their summer's hunt.

The school being established among a wild people who had known no restraints, and who could not comprehend the purposes or language of the teachers in coming to them, at first, through misapprehension, there was a good deal of trouble. On the 19th of September Elignak, one of the wealthiest men of the village, and one of his wives, both in a state of beastly intoxication, tried to force their way into the house. On the 23d of September some of the students became so boisterous and unruly in the schoolroom that they also had to be excluded from the house. And again, in November, drunken parties tried to break in and make a disturbance, so that for two months the teachers taught, ate, worked, and slept with loaded arms at hand, not knowing at what moment they might have to defend the property committed to them and their lives. They were constantly harassed with questions as to when resistance should begin and how far it would be justifiable, debating in their own minds whether it would be better to allow themselves to be robbed or murdered without resistance, or through resistance make the savages respect their manhood.

The danger to the station was greatly increased by an epidemic of the grip, which carried away 26 people in two months. This was by the superstitions of the people attributed to the presence of the white men among them. However, through tact and good management and the providence of God, hostilities were prevented, and by January the strained situation was greatly relieved. Mutual confidence sprang up between the natives and the teachers. Having heard, before going to the place, of the bad reputation of the people (which, however, it was found they did not deserve), and feeling that a people who knew nothing of schools would not endure for any length of time the restraints of a schoolroom, and the cost of building being very great (all lumber and material being sent from San Francisco, 3,000 miles), the schoolhouse was built to hold about 50 pupils, and it was thought that if 50 pupils could be obtained among such a people, under such circumstances, it would be a very great success. But to the astonishment of the teachers themselves, and to the astonishment of the friends of education interested in these Arctic schools, it was found that the total enrollment for the first year was 304 pupils, out of a population of 539 people. The average daily attendance for the last seven months of the school was 146, and the average daily attendance for the whole session of nine months was 105. As the schoolroom would hold only about 50 at a time, the teachers were compelled to divide the pupils into three classes, and hold morning, afternoon, and evening sessions of school. And then, to prevent the children who belonged to the afternoon or evening school from smuggling themselves into the morning session, or the morning children from remaining to the afternoon or evening session, it was found necessary to build two parallel snow walls some distance from the schoolroom door, and when the bell stopped ringing for school the teachers ranged themselves on either side, in order to sift the children that were trying to get into the schoolroom. It was with great difficulty that the pupils were made to understand that it was not proper to talk and laugh and jump over the benches in the schoolroom during school as much as they pleased; nor could they understand why thirty or forty visitors could not lounge about the room which was needed for those who desired to study; so that upon several occasions it became necessary to exclude certain parties from the schoolroom, but this exclusion of a few days was all that was necessary. It was considered a great punishment not to be able to come to school. During the epidemic a number of slates of the children that they had been allowed to take home at night were returned by order of the medicine men, who ascribed that much of the sickness was due to the slates and the pictures which the children made upon them—they were "bad medicine."

The teachers began their school work by learning the Eskimo names of the most important objects in daily use and training their pupils in the English equivalents. From words they proceeded to phrases, and from phrases to sentences, teaching them to translate the Eskimo into English and vice versa. They gradually added English letters and numbers, together with some elementary geography and arithmetic. Although they had had a combined experience of thirteen years in the schoolroom in the States, the teachers declare that they never had more quick-witted, intelligent pupils than these wild Eskimo children. At the beginning of the school year only a few could count ten in a blundering fashion, and nine-tenths of the pupils knew practically no English whatever. At the close of the first school year they had a good working vocabulary, knew something of geography and map-drawing, understood thoroughly the decimal basis of our numbers, could count up to one thousand, work examples in simple addition, write and read simple English words, and carry on a conversation in English on everyday practical matters. The pupils showed a remarkable desire to learn for learning's sake. During 1891-92 the average daily attendance was 106, and during 1892-93, 160.

In the summer of 1893 Mr. W. T. Lopp was appointed superintendent of the reindeer station at Port Clarence, and with his wife removed to that place, leaving Mr. and Mrs. H. R. Thornton in charge of the mission. On the 19th of August, 1893, Mr. Thornton was assassinated by two young men whom he had expelled from school for

ROMAN CATHOLIC MISSION PUPILS, KOSEREFSKI, YUKON RIVER, ALASKA.
Photograph by Rev. F. Barnum, S. J.

disorderly conduct. The community at once showed their horror at the act by summarily killing both the murderers.

After the death of her husband Mrs. Thornton returned to her parents in Maine, and the mission was closed for the season of 1893–94.

During the summer of 1894 Mr. Lopp returned to Cape Prince of Wales and reopened the school.

July 30 found us wind-bound in the lee of Chamisso Island, Kotzebue Sound. While here a search party for Mr. Gibson, a missing trader, was organized. Lieutenant White was put in charge, and, with Dr. Sharp, Mr. Justice, and myself as passengers, the expedition left the ship in one of the sailing cutters at 4 a. m. on August 1. Mr. Gibson's last camp, according to the native who accompanied us, had been on the Buckland River, which empties into Eschscholtz Bay, at the head of Kotzebue Sound. In our trip we followed the course taken by Captain Beechey in the expedition of Her Majesty's ship *Blossom* in September, 1826. In the southern part of the bay are the extraordinary ice formations which have attracted much attention among geologists. They were explored by Kotzebue, and subsequently examined by Captain Beechey, who gives the following description of the formation:

While the duties of the ship were being forwarded under my first lieutenant, Mr. Peard, I took the opportunity to visit the extraordinary ice formations in Eschscholtz Bay, mentioned by Kotzebue as being covered with soil half a foot thick, producing the most luxuriant grass, and containing abundance of mammoth bones. We sailed up the bay, which was extremely shallow, and landed at a deserted village on a low, sandy point, where Kotzebue bivouacked when he visited the place, and to which I afterward gave the name of Elephant Point, from the bones of that animal being found near it. The cliffs in which this singular formation was discovered begin near this point, and extend westward nearly in a straight line to a rocky cliff of primitive formation at the entrance of the bay, whence the coast takes an abrupt turn to the southward.

The cliffs are from 20 to 80 feet in height, and rise inland to a rounded range of hills between 400 and 500 feet above the sea. In some places they present a perpendicular front to the northward; in others a slightly inclined surface and are occasionally intersected by valleys and water courses, generally overgrown by low bushes. Opposite each of these valleys there is a projecting flat piece of ground, consisting of the materials that have been washed down the ravine, where the only good landing for boats is afforded. The soil of the cliffs is a bluish-colored mud, for the most part covered with long grass, full of deep furrows generally filled with water or frozen snow. Mud in a frozen state forms the surface of the cliffs in some parts; in others the rock appears with the mud above it, or sometimes with a bank half way up it, as if the superstratum had gradually slid down and accumulated against the cliff. By the large rents near the edges of the mud cliffs they appear to be breaking away and contributing daily to diminish the depth of water in the bay.

Remains of mammoths have been found in abundance near Elephant Point, many of which have been deposited in the British Museum. We were fortunate in securing several bones. Mr. Gibson, the missing trader, concerning whom various rumors had been circulated, some to the effect that he had been murdered by the natives, was found near his camp. He was in good health and had been on an extended trading

expedition up the river; his long detention had occasioned the rumors of his death.

On August 5 the *Bear* anchored off Point Hope. The village is located on a narrow strip of land extending about 16 miles into the Arctic Ocean. This gives it its native name, Tig e rach (finger). It has evidently been formed by two great fields of ice grounding and pushing up the sand in a ridge between them. Formerly the point extended farther into the ocean, but one year the ice pack came along with such force as to cut off the end of it, sweeping away a number of underground houses. A bitterly cold north wind swept across the sand spit as we landed upon it and made our way to the schoolhouse and mission maintained here by the Domestic and Foreign Missionary Society of the Episcopal Church.

The school was opened on the 1st of October, 1890. The day brought with it a blizzard and snowstorm that lasted for nine days. During the morning the teacher occupied the schoolroom alone, but as time wore on and no pupils came he put on his furs and started for the village to hunt up the children. Upon going outside the house he found a boy walking the beach. Taking him into the schoolroom he commenced school. At the close of the afternoon he presented his pupil with a couple of pancakes left from his own breakfast. The effect was equal to any reward of merit. That boy proved one of the most regular in attendance during the entire winter season. The next morning four presented themselves, and from that the school grew to sixty-eight. A mixture of flour, molasses, and water made a sort of cake, a little of which was given to the pupils each evening, proving not only a very cheap and efficient method of securing regular attendance, and promoting discipline, as they had to be both present and perfect in their deportment and recitations to be entitled to cake. The scholars usually arrived from 6 to 7 in the morning and remained all day. The sun disappeared on the 10th of December and returned on the 3d of January, giving them a night of twenty-four days. Lamps were required in the schoolroom from November 12 to February 9. The thermometer varied in the coldest weather from 27° to 31° below zero, the average of the winter being probably about 15° below zero. During February and a portion of March a series of blizzards set in that were beyond description. The ice was solid across the ocean to Cape Prince of Wales, 200 miles distant. The effect of the gales was such that at times it seemed as if the schoolhouse must be blown away. Snow flew in perfect sheets. The schoolhouse was located 2 miles from the village, and yet, notwithstanding the storms and distance, the attendance was good. For a few days the teacher hired men to see the little ones safely home through the storm (the two miles distance), but soon found that the precaution was unnecessary; that they were accustomed to take care of themselves.

During the past year Dr. Driggs has had the assistance of the Rev.

ROMAN CATHOLIC MISSION, KOSEREFSKI, YUKON RIVER, ALASKA.

E. J. Edson. Dr. Driggs was taken on board the *Bear* to return to the States for a vacation.

On August 7 the *Bear* started up the coast for Point Barrow, wending its way through large packs of floating ice, and on the following day caught up with the whaling fleet at anchor near Icy Cape, at the southern edge of the great arctic ice pack. The whaling fleet had been at anchor for nineteen days, waiting for the ice to open. The *Bear* lay there for fourteen days longer, waiting for an opportunity to get farther north. Parties from Point Barrow, who came down the coast for their mail, reported that the past winter had not been very cold, the lowest temperature being 30° below zero. Giving up all expectation of getting farther north, young ice forming on the sea and on the rigging of the vessel, the captain concluded to turn southward, which he did on August 22. The following day a school of walrus was sighted several miles away, and hunting parties were sent out and secured ten of them. Picking up the walrus, the vessel continued southward, calling at Point Hope the next day. On August 27, at Cape Prince of Wales, Mr. and Mrs. Lopp were taken on board, also returning to the States for a vacation.

The reindeer station was reached on the evening of the same day, and two days were spent in securing requisitions and finishing up the business of the year. On September 1, at St. Michael, the *Bear* took on board sixteen destitute miners from the Yukon. On the evening of September 4 the vessel anchored off the St. Lawrence Island village. The evening was spent closing up the season's business at the station. Requisitions were made out for another year's supplies, last letters were received, farewells were spoken, and Mr. and Mrs. Gambell were again cut off from all communication with the world for another year. September 6 St. Matthew and Hall islands were passed, and on the 7th anchor was dropped at St. Paul Island, where on the 8th a landing was made for a few hours. On September 9 a similar landing was made at St. George Island, and at noon on September 11 anchor was dropped in Dutch Harbor, Unalaska, closing the arctic cruise of 1895.

At Unalaska, by the courtesy of Capt. C. L. Hooper, I was received on board the United States revenue cutter *Rush*, on which I remained until her arrival at San Francisco, October 6. On October 9 the start was made for Washington, which was reached on the 14th, completing a trip of about 16,000 miles during the season.

I desire to acknowledge the many courtesies received from Capt. M. A. Healy, commanding the *Bear*, and from Capt. C. L. Hooper, commanding the *Rush;* also the hearty cooperation and indispensable aid rendered by the officers and crew of the *Bear* in the importation of reindeer.

I have the honor to be, very respectfully, yours,

WILLIAM HAMILTON,
Assistant Agent of Education for Alaska.

Hon. W. T. HARRIS, LL. D.,
Commissioner of Education.

APPENDIX B.

ANNUAL REPORT TELLER REINDEER STATION.

By WILLIAM A. KJELLMANN, Superintendent.

[Translated by Rasmus B. Anderson, LL. D., ex-United States minister to Denmark, author of Norse Mythology, First Chapter of Norwegian Immigration, and other works.]

PORT CLARENCE, ALASKA, *June 29, 1895.*

SIR: In accordance with your instructions dated July 2, 1894, in which you say that "upon the last day of June of each year the superintendent will make out and mail to the general agent of education in Alaska an annual report of operations at the station," I have the honor to render an account of matters at the Teller Reindeer Station for the period beginning with August 6, 1894, and ending with the 30th of June, 1895. With it will be included a report of my journey to Lapland, and of the transportation of the Lapps to this place in 1894.

I left Madison, Wis., February 16, 1894, in accordance with your instructions, bound for Lapland, via Washington, for the purpose of securing the services of five Lapp families and their dogs, and transporting them to Alaska as herders of reindeer. These Lapps were in the first place to herd the reindeer belonging to the United States Government, and in the second place teach the natives of Alaska the art of herding reindeer.

Upon my arrival in Chicago the same day, I spent the day there and at once commenced inquiries into the cheapest and best way of transporting the Lapps and their dogs from Chicago to San Francisco. The result of my investigation on this point was reported to you on my arrival in Washington the 19th of the same month.

After receiving the necessary orders and letters of introduction, that were of great service to me, and aided me materially in making my mission successful, and after receiving $1,000 from you personally for defraying the necessary expenses of my journey, I started for New York on the morning of the 20th, where a ticket was bought the same day for Trondhjem, via Liverpool and Hull, England. I traveled by the White Star Line across the Atlantic, and by the Wilson Line across the North Sea. Trondhjem is the most northern point in Norway to which tickets can be bought at New York.

On account of the short time at my disposal—only two days between my appointment and my departure for Lapland—I did not have much opportunity to prepare any definite plan for my somewhat difficult

task, but by the time I reached New York I had made up my mind how to go to work.

The large majority of the people with whom I talked, and who claimed to be familiar with the circumstances in Lapland, insisted that my journey would be useless, claiming that the Lapps could not be induced to leave their firesides on the mountains. Personally, I was very hopeful, providing I could reach Lapland before the Lapps started on their summer wanderings and got scattered over all the mountains, so that it is almost impossible to find them or get them together into one place. I was aware that there was to be a Lapp market at Bosekop, about 70 miles southwest of North Cape, the 7th, 8th, and 9th of March, 1894, and to this market there would come hundreds of Lapps personally known to me for the purpose of selling reindeer meat, skins, reindeer thread, hair, shoes, antlers, etc. This market is held at fixed times in each year, and it had been one of the points which I visited while I was employed for several years by a large firm as buyer, and hence my acquaintance with many of the Lapps who congregate there.

To reach North Cape, in Norway, from New York in so short a time—fifteen to sixteen days—was hardly to be expected in this season of the year. I therefore telegraphed from New York to a commercial house in Hammerfest, asking it to make my coming and my errand known to the Lapps, if possible, before they met at the market, in order that they might begin to discuss the matter with their families at home and so be prepared to come to a decision. The wisdom of sending this telegram was afterwards demonstrated, and it saved me much travel and expense after I reached Lapland. Having made all my preparations I went on board the *Majestic* and at 6 o'clock on the 21st of February the steamer left New York with five hundred passengers on board.

The weather was fine for that season of the year, and on the 27th, at 12.45 p. m., Ireland was sighted. During the afternoon of the same day passengers and mail were landed at Queenstown, and the next morning at 8 o'clock we arrived in Liverpool. It took about four hours to land the passengers and their baggage, and two hours more were spent in getting through the custom-house. From the custom-house I went directly to the railroad station and took a train at once for Hull, where I arrived at 6 o'clock in the evening in a pouring rain. Half an hour later I was pacing the deck of the Wilson steamer *Juno*, and at 8 o'clock the same evening, February 28, this vessel left the dock and proceeded into the North Sea, bound for Trondhjem, Norway.

This season being unfavorable for tourists, there were few passengers. Had I been delayed a few hours across the Atlantic I would have had to wait a whole week in England for the next steamer to Norway, there being only weekly steamers during the winter. Thus I saw the waves of the Atlantic and those of the North Sea and crossed England all on the same day. The North Sea was rough, as usual in

this season of the year, but its breakers had no effect on me. Fortunately I have never been seasick. After three days we reached Bergen, Norway, on March 3, and remained there one day. I improved this time to call on the United States consul, Mr. Gade, and consulted him in regard to the speediest way of getting to the far north. The consul made some inquiries by telephone, and then advised me to continue my journey in the *Juno* to Trondhjem, whence a fast steamer would depart on the night of the 5th.

We left Bergen in the evening, and after stopping at a couple of places to land passengers and mail, March 4 at noon we were in the harbor of Christiansand, and the captain of the *Juno* informing me that we would not reach Trondhjem before late in the evening, which would give me no time to go to the city to arrange my affairs, I sent a telegram from Christiansand to the American consular agent requesting him to meet me in the harbor on the arrival of the *Juno*. When the ship entered the harbor of Trondhjem, about 10 o'clock in the evening, the consular agent met me on board. He kindly took my draft and had a part of the money sent to me a week later, when the advices had arrived by mail. The fact was, I had gained just a week on the mail that left New York at the same time that I did.

This arrangement made it possible for me to continue my journey northward. At midnight I went on board the steamer *Vesteraalen*, bound for Tromsöe. During the most of this trip we had snowstorms, but the steamer made good time, and we anchored in the harbor of Tromsöe on the 7th of March. Hitherto I had progressed even more rapidly than I had expected, but this was the first day of the Lapp market, 180 miles away. The journey from New York to Tromsöe had been made in fourteen days, the best record ever made, and it will probably not soon be equaled again, but I had traveled continuously without interruption. Tromsöe is located at 69° 40′ north longitude. Though unwilling, I was obliged to remain there one day, but I employed this time in hunting up more Swedish Lapps, who were there accidentally. They gave me but little comfort. They admitted that there were many Swedish Lapps who had lost all their reindeer on account of the hard crust of ice on the snow, which made it impossible for the animals to get their fodder. Many reindeer had perished from hunger. The same was the case at Karasoanda, where many Lapps were suffering, but the Swedish Lapps assured me that it would be useless to try to get them to go to America. That would be asking too much. They would suffer a great deal before they would leave their native heath.

On March 8 I took a steamer for Hammerfest, where I arrived on the 9th. The first thing I had to do there was to borrow some money, as the draft I had received in Washington had been left in Trondhjem. I found no trouble in getting what funds I needed, as I was well acquainted in Hammerfest. The cablegram which I sent from New York had been duly received, and Messrs. Feddersen & Nissen had

done everything possible to make my mission known among the Lapps, both through their agents in Lapland and at the Lapp market. Messrs. Feddersen & Nissen, the gentlemen to whom I had telegraphed from New York, gave me many valuable suggestions after they became better acquainted with the purpose of my journey. I was yet a long way from the Lapp market, but I telegraphed to some of my friends who were attending the market, and in this manner about thirty Lapps were persuaded to await my arrival and hold a conference with me personally. I left Hammerfest on the evening of the 11th on a small tugboat for Bosekop, where the Lapps had been waiting for me for two days. They received me as an old acquaintance. We chatted awhile about the result of the Bosekop market, about the prices of meats and skins, about the sleighing, etc. I told them news from America, and treated them to some delicacies that I had brought with me from New York. As they had never before tasted anything from New York, they looked upon this as a great compliment. The first day was spent in this manner, and the next day we met again to discuss Alaska and my errand. Two of the Lapps whom I had thought of interesting in my mission were absent, and I was told that they had gone to Russian Lapland to attend a Lapp market there.

In explanation of the slow progress I was making, it is necessary to state that the Lapps, like the reindeer, can not be crowded or forced in any way, and least of all in business matters. Time alone, and I had but little of it at my disposal, is able to produce a result. After the first meeting they seemed to look upon my proposition with favor, and I felt greatly encouraged for the next day. It was my purpose to engage only such Lapps as owned herds themselves, and not such as for any reason had lost their herds. A man who is not able to take care of his own property is not likely to be able to look after the property of others. On the afternoon of the 12th of March the Lapps met again, and I then told them all that I knew about Alaska and the reindeer enterprise there, and also restated my errand. I explained what kind of people I wanted. I informed them what their pay would be, that they would be transported free of cost, and described the details as fully as possible. During my talk to them they kept perfectly silent, and for a long time they seemed to be considering the matter, but no further progress was made that day. During the next four days the discussion was continued, and I had to answer hundreds of questions.

On the morning of the fifth day all the Lapps were ready to depart for their summer quarters. In the course of the night they had gathered their reindeer and were ready to start. It looked as though they would compel me to go to the mountains—that is, to Kantokeino, 120 English miles away—and continue the discussion there. I secured what seemed like a final opportunity to engage them in conversation. I then indicated to them that I would hire Lapps from some other place if they did not decide the matter at once, and so they would lose their chance

of making and saving some money. This was my last card. I had no doubt that the prospect of accumulating some money, which on their return could be deposited in a bank, would induce them to leave their old mountains. An empty sled passed, and I at once jumped into it and drove to the nearest station. I bid these stubborn people good-bye, but before doing so they agreed to send a man down from the mountains to meet me at Bosekop the 26th March, and bring me the result of their deliberations with their families, and I promised not to engage any other Lapps before that date.

In the meantime I went to Talvik, and beyond there to Stoe-Sandnoes and Tappeluft, to see some of the Lapps camping on the mountains in the vicinity. None of them could make up their minds at once to make a contract, nor did I want them to do so; I merely wanted to have them in reserve in case I failed to secure those I had already talked with at Bosekop.

On the 26th of March I was at the place agreed on, and on the same day two Lapps also arrived. I secured their services, and I at once made a contract with three Lapps, the two present having authority to sign for a third party, who was absent. Having secured these three, I looked upon my mission as a success, for the three men belonged to the best families of Kontotseino, and when they were willing to go to Alaska I was sure that it would be easy to get as many more as I wanted. On the 28th a third man came to make a contract, but on account of a lawsuit in regard to a sack of flour he was not certain that he could get away. I consulted the lensmand in Bosekop in reference to the sack of flour, but as he declined to act in the matter it became necessary for me to go to Hammerfest at once. There I secured the release of the Lapp and permission for him to emigrate, and I returned to Bosekop on the 1st of April. This Lapp then also signed the contract and went to the mountains to get ready for the journey, which was set for April 15. This last Lapp also had authority to sign for another one, and so I had now secured five in all. We agreed to meet on the 13th of April, as we would need a couple of days for the final preparation. I had now secured five families, and four of them were those that I had originally planned to get.

After completing the contracts I again went to Talvik to inform the Lapps there that I had already secured the required number, and that they did not need to give the matter any further attention. On this journey I received your letter requesting me to secure a sixth family, viz, a Roman Catholic, to be sent to a Roman Catholic station in Alaska and herd the reindeer there. But a Roman Catholic family of Lapps was more difficult to get than five more Protestant families, for nearly all the Lapps are Lutherans. I learned, however, that a Lapp boy had been adopted by a Roman Catholic missionary station at Altengaard, in the vicinity. The boy had got tired of the narrow limits of the missionary

station and had run away to be with the reindeer, and I at once secured him at a low price and took care of him until the other Lapps arrived.

From the 10th to the 13th of April I was busy getting ready to receive the Lapps. In company with those I had hired, there came one more family all ready for the journey. I thought it unfortunate to send the boy, who was only 18 years old, alone to the Roman Catholic station. He was hardly capable of handling a herd of reindeer, particularly in a strange country and among strange people, so I engaged this additional family to go with him. This family was the fifth that I had originally planned to hire. When they saw that other good and reliable people were willing to go, they concluded that there could be no doubt about the character of our enterprise.

After getting the baggage as dry as possible, it was all packed on the 14th of April, and on the 15th we went aboard the steamer *Nordland*, and arrived in Hammerfest on the 16th. On this first day of our journey there was no end of music, singing, and tears. Some of the relations and friends of the Lapps had come down from the mountains to see them off. These relations and friends accompanied us to Hammerfest. We had to spend the 17th in Hammerfest waiting for a steamer.

The Lapps whom I had engaged and who were now with me on their way to Alaska were the following:

Names of the men.	Ages of men.	Names of their wives.	Ages of wives.	Names of the children.	Ages of children.
Per Aslaksen Rist	50	Left his wife in Lapland.	.....	.....	.....
Johan Speinsen Tornensis	35	Margrethe	28	Berit	[1]10
Aslak Larsen Somby	48	Britha	46	Berit Anne	[2]11
Mathis Aslaksen Eira	25	Berit	37	Aslek	4
Mikkel Josefsen Nakkila	32	Berit	24	.....	.....
Samuel Johnsen Kemi	46	Kjersti	27	Karen	[1]9
Frederik Larsen	18	.....	.....	.....	.....

[1] Months. [2] Years.

The Lapps do not like to leave their ancient homes. They are very conservative, devoted to the customs and manners of their fathers, and exceedingly fond of the fresh mountain air. They are also very cautious in all their business transactions. When we add to this the fact that they have frequently been deceived by persons who wanted them for exhibitions in foreign lands, it will readily be understood that it was no easy matter to secure them for far-off Alaska.

Cranks are to be found everywhere, and also among the Lapps. Such cranks think it their duty to meddle with everything that takes place, no matter whether it concerns them or not. I found such a crank among the Lapps, and he gave me much trouble. He took the position that a great mistake had been made by not consulting him. He was angry and went to the royal Norwegian officer, who was to witness our

contracts, and told him all sorts of yarns, and persuaded him that he ought not to legalize the contracts without sufficient guaranty that the contracts would be fulfilled. The crank argued that inasmuch as the Lapps had been swindled heretofore they were sure to be swindled this time. You know the result of this meddling. I had to telegraph to Consul Gade, in Bergen, and he advised me to cable to Washington. I did so, and received a satisfactory answer. Had I not received this answer in due time, the Lapps would certainly have broken their contracts and gone back to their mountains believing that all was humbug, only a little better concealed than is usually the case.

At 7 o'clock p. m. we all went on board the steamer *Vesteraalen*, bound for Trondhjem. From Hammerfest to Trondhjem I had obtained the best rates from the Vesteraalen Steamship Company, and from Trondhjem to New York, via Christiania, I had obtained the most favorable rates from the Thingvalla Steamship Company.

The journey from Hammerfest to Trondhjem took three days. The Lapps were very despondent, and I had all I could do to comfort them and restore their lost courage. On the 19th they crossed the Polar circle for the first time in their lives, and on the 20th we arrived in Trondhjem, where we remained two days. During this time the Lapps unpacked and dried their baggage, and here I settled my money matters with Mr. Claus Berg, our consular agent, bought tickets, and had my Lapps examined by the proper authorities. Their contracts were countersigned by the chief of police to prevent any annoyance in the future. Everything was in order the 23d of April, when we boarded a train for Christiania. It was the first experience of the Lapps on a railroad train, and they were naturally very anxious. Whenever the locomotive whistled they would seize hold of the seats with both hands; but when they found that the train moved as steadily as any reindeer pulkha on the mountains of Lapland they loosened their grips on the seats and began to talk about the ingenuity of man. They were astonished at the tunnels we passed through, and looked with wonderment at the broad fields and at the farmers who were plowing.

In the afternoon we reached an altitude of 2,155 feet above the level of the sea. Here we found plenty of snow, and where the ground was bare it was covered with reindeer moss. All the strange things the Lapps had seen had gradually made them forget their sadness, and the sight of the moss filled their hearts with joy. As the trains do not run in the night in Norway, we spent the night at Tonseth. The next day we continued our journey down through the valley of Glommen, and the Lapps spent the time admiring the new things. They looked at the rafts floating down the river, at the well-cultivated farms with their nice red and white houses, and watched the new passengers getting on and off the train at the stations. In the afternoon we changed cars at Hamar Station, and on the evening of the 24th of April we came to

Christiania, the capital of Norway, where we were met by a representative of the Thingvalla Steamship Line and by a friend of mine, who had been sent to me by Mr. Magnus Andersen, the editor of the Norsk Sjofartstidende. These gentlemen were of great help both to me and to the Lapps. During our stay in Christiania we were all, with the exception of the dogs, examined by a physician and pronounced well. Cages were bought for the dogs, and all our baggage was weighed and checked. We also procured tin cups and other necessary things for the journey, and half an hour before the time of sailing we were all on board the ship, ready, with about two hundred other passengers and emigrants, to sail for the New World.

On the 26th of April, at 2 o'clock in the afternoon, the Thingvalla ship *Island*, Captain Schjott commanding, steamed out of Christiania Harbor with the first company of Lapp emigrants on board. We had fine weather, and after an hour's sail we met another steamer of the same line coming from New York. The two ships exchanged greetings, and our vessel proceeded to Christiansand, where we arrived on the morning of the next day. Here we received the mail and a few more passengers for New York. In the course of the forenoon I here had an opportunity of sending a last greeting, together with letters, to our friends, and at 12 o'clock noon we proceeded into the North Sea.

Perhaps this would be the best place to express my thanks to many prominent men in Norway who were of great help to me on various occasions. I am under special obligations to the United States consul in Bergen, Mr. Gade; to the commercial house of Feddersen & Nissen, at Hammerfest; to Lensmand H. C. Borchgrevinck, at Alten, and to Capt. Magnus Andersen, the well-known successful commander of the *Viking* across the Atlantic. It will be remembered that Captain Andersen brought the *Viking* ship to the Columbian Exposition, in Chicago, and that he is the editor of the Norsk Sjofartstidende, in Christiania. All these gentlemen aided me materially in bringing my mission to a rapid and successful close.

We crossed the Atlantic slowly but safely. The Lapps were not seasick, but a couple of the women were slightly indisposed. On the other hand, the dogs suffered considerably, not only from seasickness but also on account of the warm atmosphere of the ship. Two of them were very sick for a couple of days, and one died and was buried in the largest of all graveyards, the Atlantic Ocean, on the 10th of May, at 8 o'clock in the forenoon. Captain Schjott gave our quadrupeds the liberty of the deck a few hours every day, and was very accommodating in every way. When we arrived in New York on the 12th of May, he placed us under special obligations by his willingness to serve us in every way possible.

In New York I expected to meet a gentleman who was to assume the care of the Lapps to San Francisco, Cal., but circumstances prevented

his making his appearance. I received a letter from Mr. William Hamilton, and a draft for money, with orders to proceed at once to Madison. In this letter I was informed that upon my arrival at Madison, Wis., Prof. Rasmus B. Anderson would take charge of the transportation from that point, and so it became necessary for me to hasten matters myself in New York as best I could, with the kind assistance of Captain Schjott. At 11 o'clock in the forenoon we were landed, and there was a running to and fro to get things into shape. The most difficult thing was to get the dogs removed from the ship, as these fellow-travelers of ours were not found in the list of passengers, and consequently did not come under the charge of the officers of Ellis Island. The dogs were a part of the baggage, and had to be taken through the custom-house.

We brought the dogs ashore for breeding purposes, but did not have the necessary certificates from the breeding station in Europe whence they came, for the simple reason that the dogs did not come from any breeding station, but from the mountains and snow fields of Lapland. By the assistance of a quick-witted broker, we got the dogs out of the custom-house by my signing a long document full of assurances, and this document was no doubt carefully preserved for future reference. It was a great relief to get this business out of the way, but then it came like a bolt of thunder out of a clear sky that the dogs could not be transported any farther as baggage, and so there was another running hither and thither, which ended in my taking the dogs to the express company and sending them by express, a matter of no slight expense, as you have seen from the statement of my account rendered to you a year ago, but there was no other way, and although the Lapps protested vociferously against being separated from their dogs, it could not be helped. At 6 o'clock in the afternoon, matters were sufficiently arranged so that I could begin to think of the Lapps. They had passed the necessary inspection at Ellis Island and had come to the city, where they were found in a hotel, at which we all got a refreshing supper. Then we went to the ferry and to the West Shore Railroad station, where we took the train at 8.30 in the evening, utterly exhausted from the heat and work of the day.

We bought second-class tickets from New York to Madison, Wis., at the ticket office of E. A. Johnson, in New York. But these tickets proved to be very defective, partly perhaps on account of the hurry in which they were issued, for transfer coupons lacked on several of them when we arrived in Chicago, and our only compensation for this extra expense and for taking second-class tickets was, that we arrived in Chicago four hours later than passengers who had left New York two hours earlier than we did and bought emigrant tickets. The trouble and annoyance are now forgotten, and so I will say no more about it, but keep the matter in remembrance until the next time. On Penticost Sunday, the 13th of May, we reached Buffalo. Here we changed cars

for Chicago, Ill., where all of us were vaccinated in accordance with a decision of the authorities. Our departure from Chicago was telegraphed to Prof. R. B. Anderson, at Madison, Wis., and on our arrival there he had provided temporary lodgings for the Lapps. After an absence of nearly three months, occupied during the whole time in traveling and caring for a lot of helpless human beings and animals, the writer again stood on the station platform in Madison pretty tired and exhausted. The dogs had arrived there the day before.

As my journey to Lapland had been made unexpectedly, and as I had no one to look after my private affairs, I needed a few days at Madison to settle my business and pack my. goods for a removal to Alaska. The baggage of the Lapps had become musty, and so I arranged with Prof. R. B. Anderson to remain a few days in Madison, Wis. Arrangements were made to transport the Lapps by way of the Great Northern Railroad to Seattle, and thence by steamer to San Francisco, and as soon as we were ready to leave Madison the tickets were on hand and delivered to me. We were placed in a very comfortable so-called tourist car, where the Lapps were able to cook their own food and do as they pleased. On the evening of May 22 the train left St. Paul.

We expected to be in Seattle in a few days, but the floods in the Rocky Mountains were not anticipated, and hence we miscalculated. Meanwhile we made good progress until the afternoon of the 24th, when we arrived in Kalispell. The only misfortune we had had up to this time was the death of one of our dogs on the 23d. When we arrived at Kalispell we were told that we could not proceed before the next morning, on account of a washout, but when the next morning came we were told that we would have to wait until the following morning, and doubtless we would have heard this promise for a month if the passengers had not begun to insist on being sent back and transferred to another line. Trains continued to come in from the East, leave their passengers, and return, so that had this importation been continued the town would soon have become congested with people; but finally orders were received to go back to Harvard, which was done on the 26th of May.

During our stay at Kalispell we had the misfortune of having one of our best dogs stolen from us. One day the dogs had been taken out of their cages to be bathed, a matter which we attended to as often as possible. After bathing the dogs were brought back to the station and given their liberty for a short time. In the meantime it was necessary for me to go to town to secure provisions for my people, and on my return one of the dogs was missing. Inquiry was made through the town, but the dog was not found. The search had been abandoned and the Lapp was weeping over the loss of his dog when a small boy reported that he had seen a man and a black dog go westward on a hand car. We at once went to find the foreman of the railroad section, and from him

we learned that no hand car belonging to the section had that day gone west of the town, but that a hand car had been in from the nearest section house. Having one more witness that a dog had been seen on a car that day determined me to try and catch the thief. This was accomplished with a borrowed hand car and four men and a Lapp, as no train or other means of transportation could be secured. It was already dark in the evening before we had gone the 20 miles and the section house was reached, where we found all hands playing cards, and after a few indirect questions had been answered the dog was found to be in the house. On a definite demand for the stolen dog it was produced. The thief made the excuse that he had bought the dog of a boy for 25 cents, and as we had no time to remain there and bring suit we let the fellow off after giving him some fright, so that he will henceforth probably abstain from going off with another man's dog.

At 11 o'clock in the evening we came to the railroad station, and left there the next morning for Harvard, where we arrived in the afternoon, and spent the night there until the 27th, when we continued to Helena, Mont. We had to spend the night again at Helena, and there we were transferred to the Northern Pacific Railroad the next day. After conflict with the agent at Helena, he being unwilling to furnish food for the Lapps, we were taken into another car and proceeded to Horse Plains, arriving there on the 28th. Here we had to stop again on account of washouts. The washouts were not repaired until the 30th, when we started for Herron Station, a few miles west. There we stopped again until the 31st of May, when we proceeded a few miles and reached Clarks Falls in the evening; thence we proceeded again the same night, and advanced steadily, though slowly, until we finally reached Seattle, Wash., the 1st of June, late in the evening. I pass over all the annoyances, disputes, and trouble on this journey. I tried in every way possible to secure provisions for the Lapps and dogs from the railroad company, but was only partially successful.

The 2d of June we were transported from the railroad station to the steamer *Umatilla*, destined for San Francisco via Victoria. The weather was fair, but one of the Lapps was quite sick. He was not seasick, but apparently suffering from the heat, dust, and atmosphere of the railroad car, which doubtless had had their influence upon the lungs accustomed to the fresh mountain air. In Victoria I procured some medicine, and his health was much better when we arrived in San Francisco the 4th of June, having been fifteen days on the way from Madison, Wis.

As indicated by your letter of May 1 from Port Townsend, I telegraphed from Seattle to Messrs. S. Foster & Co., No. 28 California street, San Francisco, and announced our departure. Accordingly, a gentleman met us on the dock and brought us to a comfortable hotel called Sailors' Home. The brig *W. H. Meyer*, which was to take us to Alaska, being under repairs on our arrival, we could not go on board

at once, as suggested by you, but had to remain ashore. Better quarters than those we had could not have been secured in San Francisco. Both the location and the management made it impossible for the Lapps to get out into bad company.

During our stay there my time was entirely occupied in selecting supplies and provisions which we were to take with us, taking charge of the Lapps, and in looking after other necessary things, so that I did not have much time to look after my wards, but Captain Staple, the manager of the Sailors' Home, cheerfully took charge of the Lapps, showed them the city, and kept them away from dissipation. During our sojourn in San Francisco one of our Lapps was married in the chapel of the Sailors' Home by Rev. T. L. Brevig. The marriage ceremony should have taken place at Bosekop, Norway, before our departure, but was postponed on account of the limited time. The Lapp in question was delayed on his journey from the mountains on account of the bad roads. Then it was decided that the marriage should be performed at Madison, but difficulties also hindered us there, and so the wedding was finally celebrated in San Francisco.

When the vessel was ready to sail all the Lapps went on board. This was on the 16th of June, and the vessel was to start on the 17th, but on that very day the captain and the vessel owner received information that another of his vessels, which had been out on a whaling expedition in the Arctic Ocean, had been wrecked. This necessitated the captain's presence in San Francisco to equip another vessel to take the place of the wrecked one and to find another captain, and thus our journey was postponed another day. Finally, on the 18th of June, we were all assembled on board the brig *W. H. Meyer*, Captain Holland commanding, and bound for Port Clarence, Alaska, via St. Lawrence Island, where Mr. Gamble and company were to be left.

I here seize the opportunity of expressing our most hearty thanks to Prof. R. B. Anderson, of Madison, Wis.; to Captain Staple, superintendent of the Sailors' Home, San Francisco, and to Messrs. S. Foster & Co., No. 28 California street, San Francisco, for their kind assistance and advice during our sojourn in these places.

The ship first sailed in a northwesterly direction until we were only 150 miles from Honolulu; then we turned the prow to the west and northwest until we were off the Sandwich Islands, where we had a perfect calm for a couple of days. Then we sailed to the northwest a couple of days and then due north until we came in the vicinity of Fox Islands, where heavy fogs hindered us from sailing between the islands; but after lying still a few days the captain decided, on the 22d of July, to sail through the so-called Seventy-two Pass. He had not seen land, but had taken an observation. He was successful, and when we had passed the islands the fog lifted so that we could see them behind us. Soon the fog again became so dense that we could see nothing for three whole days, excepting that we got a glimpse of St.

Mathews Island. During the night between the 27th and 28th of July we came near running ashore on the west side of St. Lawrence Island. During the darkness of the night the ship had drifted in among the breakers before we became aware of our danger. We were scarcely a hairbreadth from being wrecked against the rocks of St. Lawrence. We were most fortunate in escaping this danger. The next day the water was calm, and two boats filled with the first Alaska Eskimo we had ever seen came on board. On the night of the 29th a stiff south breeze was blowing. The same wind favored us the next day, and this brought us past Kings Island and within Point Spencer, in Port Clarence, where we anchored for the night. Next day we again weighed anchor and sailed to the reindeer station, where Mr. and Mrs. Lopp came on board and invited us to come ashore, an invitation which we were more than happy to accept after a tedious journey of forty-one days in a most uncomfortable ship. We went on board again in the evening, and we were not landed until the 31st of July.

On our arrival at the station, both Rev. T. L. Brevig and the writer and his family were most kindly received by Mr. and Mrs. W. T. Lopp, and everything possible was done to help us become familiar with our new surroundings. No pains were spared to satisfy our immediate wants, even though Mr. and Mrs. W. T. Lopp had to make a sacrifice of their own comforts.

There was no formal assuming of the affairs of the station, but it may be said in general terms that matters were under our control from the 6th of August, and one of the Lapps, together with two apprentices, were sent out with the herd. The other Lapps were set to work to make salmon seines, and in the course of a few days we had five of them busy securing fresh fish for our tables. The dried goods of last year had been consumed and the goods for this year came with the *W. H. Meyer*. All the resources had been exhausted, so that it was necessary to begin using the provisions we had brought at once. In accordance with your instructions, dated the 27th of July, 109 reindeer (92 females, 8 bucks, 5 steers, and 4 sled deer) were taken out of the herd in August and marked and delivered to Mr. W. T. Lopp to be transported to the American Missionary Association mission station at Cape Prince of Wales.

In addition to these 109 deer, 10 females, belonging to apprentices from the same mission station, were taken, marked, and sent. These apprentices returned to Cape Prince of Wales Station. Your instructions called for only 100 reindeer, but after the separation 9 of the Government herd were mixed with the mission herd and could not afterwards be separated, since the fawns were in the latter herd. As there was no enumeration of the herd or any formal delivery of it to us, I took a census of it as soon as I found the opportunity. By adding the reindeer that had been taken from the herd in the summer and those that were lost after I arrived, I found the actual number of reindeer in the herd on the 6th of August, 1894. What has become of

all these reindeer the following table, being the record kept at the station, will show:

Reindeer account.

Date.		Dr.				Cr.			
		Male.	Female.	Fawns.	Total.	Male.	Female.	Fawns.	Total.
1894.									
Aug. 6	Received from W. T. Lopp					79	311	119	509
8	Delivered to the American station at Cape Prince of Wales.	17	80	12	109				
8	Given to apprentices:								
	Metex ite		2						
	So kwee na		2						
	Ki year grick		2						
	Ki ok		2						
	Oeteune		2		10				
30	Marked to other apprentices who stayed at the station.		18		18				
Sept. 6	Received from Sheldon Jackson					27	4	2	33
30	Died and killed	3	6	5	14				
	Balance	86	201	102	389				
	Total	106	315	119	440	106	315	119	542
Oct. 1	Number of deer in herd					86	201	102	389
11	Bought from O kwood let						2		2
12	Bought from apprentice, So whe na sie						2		2
31	Died and killed	7	3	3	13				
31	Given to the manager	1			1				
	Balance	78	202	99	379				
	Total	86	205	102	393	86	205	102	393
1895.									
Jan. 4	Reindeer in herd this day belonging to Government.					78	202	99	379
31	Delivered to Eskimo apprentice Antisarlook as a loan.	21	70	9	100				
31	Marked to apprentice		13		13				
Mar. 31	Died and killed	5	1	90	6				
	Balance	52	118		260				
	Total	78	202	99	379	78	202	99	379
Apr. 1	Reindeer in herd belonging to Government					52	118	90	260
June 30	Died and killed	2		1	3				
	Fawns born							118	118
	Balance	50	118	207	375				
	Total	52	118	208	378	52	118	208	378
	In herd this day belonging to the Government					50	116	207	375

These 375 animals will be carried over to a new account, in which the fawns, previously named, will be divided and placed in their proper columns as males and females. In the herd on the 30th of June, 1895, I found belonging to the United States Government, 90 males, 167 females, 118 fawns; belonging to apprentices, 12 males, 12 fawns; making a total of 90 males, 179 females, 130 fawns.

Extract from quarterly account.

Date.	Character of disease and cause of butchering.	Male.	Female.	Fawns.	Total.
1894.					
Aug. 6	Killed; swelling in feet, unable to work			1	
8	....do			1	
8	Killed; broke his leg while running			1	
15	Strayed; afterwards shot and stolen by Eskimo from Cape Prince of Wales		1		
24	Killed; could not keep up with herd			1	
29	Killed; liver and lung disease			1	
29	Died; liver and lung disease		2		

Extract from quarterly account—Continued.

Date.	Character of disease and cause of butchering.	Male.	Female.	Fawns.	Total.
1894.					
Sept. 13	Killed; 3 ribs broken in a fight	1			
14	Stolen by Eskimo; only head and antlers found		1		
22	Died; liver and lung disease		1		
29	Killed; liver and lung disease	2	1		
	Total	3	6	5	14
Oct. 5	Died; liver and lung disease		1	1	
19	....do		1		
19	....do		1		
20	....do	1			
Nov. 15	Died; broke his neck	1			
17	Killed; broke 2 legs			1	
27	Sold to Laps for food	1			
Dec. 19	Killed to feed herders	2			
21	....do	2			
	Total	7	3	2	13
1895.					
Jan. 3	Died; liver and lung disease			1	
Feb. 15	Died; froze to death on an expedition	1			
23	Killed; liver disease	1			
28	Died; liver disease	1			
Mar. 20	Killed	1			
26	Stolen; shot by Aksegrook	1			
	Total	5		1	6
Apr. 3	Killed; broke his leg in driving	1			
9	Died fighting			1	
17	Died; lung disease	1			
	Total	2		1	3
	Grand total				36

As you will see from the above tables, we have killed and lost 36 deer during the past year. This number is not small considering the size of the herd, but it was the best result we could produce. As you will also perceive, there was a severe disease among the deer last autumn, a liver and lung epidemic taking off 15 of 36 deer lost or killed. The disease was of short duration. Nothing was observed before the deer suddenly left the herd and wandered off by themselves without taking any nourishment, and death followed a day or two later. All the remedies we could think of were applied, but absolutely without benefiting the diseased animals. The herd was changed to new pastures, milking was stopped, but those that were attacked by the disease died all the same. The same disease is also known in Lapland, but no remedy is known there. One of our Lapps had to kill over 90 reindeer in his herd in Lapland in a single autumn on account of this same disease. At the outbreak of the disease it seemed that we would lose many more animals than we actually did. It is to be hoped that we will escape this danger in the future, for we think we have discovered the cause, a matter which I will not discuss at this time, as we have not gathered a sufficient amount of facts. When we subtract these 15 animals and the 6 killed for food, the loss is 15 per cent, which is more than is calculated in Lapland in herds of the same size as ours.

The annual loss in private and other herds in Alaska does not exceed

8 per cent, while the Government herd will always have a higher percentage of loss as long as it is managed for the purpose of education, for such a herd can never be handled so carefully as a private herd. As long as it is necessary to have apprentices in connection with the herd, they must have an opportunity of practicing the various methods of handling the animals in connection with lassoing, taming, driving, etc. This, of course, causes more or less disturbance, much more running to and fro of the herd, than if it were private. A private herd is left undisturbed all of the time, hence there is less of broken backs and other injuries. These disadvantages can not be avoided, for it is necessary for the apprentices to practice if they are to make any progress. In the account you will also notice that 3 animals were stolen by the Eskimos. I was successful in capturing only one of these thieves, to wit, an Eskimo by the name of Axsegroak, from Nook, the nearest village east of the station. On the 26th of March, during my absence on a journey to Golovin Bay, he shot one of our deer. It had been set at liberty by one of our apprentices while returning home from Antisarlook herd on account of weariness, about 4 miles east from the station. They were unable to bring it home before the herd was gone, so left it so that it could be united with it on their return home. Our people looked after the animal several times, and were constantly aware of its whereabouts.

Although it does not belong to the chapter, I will take the liberty of relating here how we captured and punished this thief. On my return, the 31st of March, it was soon reported that a reindeer had been shot by some Eskimos or others. But no one knew or was willing to know who the thief was, the Eskimos being, as a class, great cowards; so that when one of them has done anything wrong the others dare not say anything about it for fear of being themselves shot by the criminal. For this reason they did not dare report the stealing of the reindeer, but simply stated that it had been shot and eaten; but I resolved to get this matter straightened out, and to this end I instituted direct and indirect investigation, the only result of which was that our apprentices knew who the thief was but did not dare to tell the truth. On one of my daily visits in the houses of the apprentices and herders, all the apprentices were asked whether they would not tell me the circumstances pertaining to this matter. I received no answer from any of them, but one of the wives, who stood near the stove, made some comprehensible signs and nods with her head toward a man who sat in a corner of the room. A single moment's consideration convinced me that the thief was sitting in the corner, on which account I immediately addressed him and asked him in very positive terms whether he had shot our reindeer, to which he hesitatingly nodded with his head without opening his lips. He apparently did not think it worth his while to say yes.

I considered the matter of great importance, as this was the first

stealing of reindeer of which I had obtained proof, and I decided to establish an example for future thieves. With this in mind I made it clear to him, perhaps using rather strong language, that he was a thief and much more; but he, of course, did not understand anything of what I had said, but his courage failed him when I made motions indicating that he would have the pleasure of trying a pair of handcuffs, upon which I left the house in order to carry out my threat. I did not go after the handcuffs, but directed my steps to Rev. Brevig, to tell him of the discovery I had made. We had not discussed the matter very much before the culprit came, seated himself on the floor, and gazing at me with an inquiring look, he said, "Me no good," and as he received no answer he took his knife from its sheath and placed it before his breast to kill himself on the spot; at least, he looked that way. But when Rev. Brevig and myself talked to him, he was persuaded to abstain from the execution of this threat, and he then asked whether we wanted him to go home and take his life there. We assured him that that was not what we wanted. We sent after one of our apprentices, who understands English, and, employing him as our interpreter, we delivered a reprimand to the Eskimo and then began questioning him in regard to the details.

From this examination it appeared that he had nothing to eat; that he was about dying from starvation when one of the reindeer from the station was feeding near his house; that ten of his neighbors helped him to eat the meat. He was told that to steal reindeer was just as wrong as to steal from another man's winter provisions, which the Eskimo regard as a very great crime. In regard to his starving to death, we told him that he well knew that we would not permit any good and honest needy person to suffer, a fact of which we had given ample evidence. Then we gave him an account of what was done with thieves among the white, civilized people. There thieves were incarcerated and punished. Then the Eskimo burst into tears. He confessed his weakness and admitted that he was not liked by the other Eskimo, not even by his own mother, and that the best thing for him now would be to end his miserable life. It may also be added in regard to this person, that he was looked upon as a black sheep among the Eskimo who frequently had warned him in regard to Nanugak, the thug, who last spring was shot by another Eskimo about 400 yards from our station.

I was told that Axsegroak and Nanugak were the two meanest fellows in this locality. Both of them employed the same tactics; that is, frightened the other Eskimos, and in that way made them do just as they pleased. They took this way of getting their living easily. Both of them were lazy and did not care to work for their living. We advised this man to be industrious, honest, and good, in which case he would be liked both by his mother and by the other Eskimos, and all would then do everything possible to help him along in the world. The fact that ten other Eskimos had helped him eat the meat without doing any-

SKINNING REINDEER.
Photograph by William Hamilton.

thing about it brought me to the conclusion that all who had had a share in it ought to pay for it. I rendered a decision as seriously as a judge. My verdict was that everybody who had eaten of the stolen deer should pay one fox skin, and that the reindeer skin should be brought to the station. The Eskimo breathed easier when he heard my decision, and when he was told that he might now start for home and inform his companions in regard to the result of the stealing, and that Oomalik (superintendent) was fearfully angry on account of this event, he did not need to be told twice, but started off like a whipped dog. The next day he returned, bringing with him the reindeer skin and a fox skin and a couple of his guests, one of whom understood a little English.

The year before he had been in an Eskimo show on a trip in the States. My verdict was repeated to them and a second reprimand was delivered, whereupon we gave them something to eat and let them go home. During the following two weeks all the guilty parties, nine in all, brought me a white fox skin apiece. Two were permitted to contribute one fox skin together, as they were very poor and it being all they had. Of course this was only a small fine, but it was felt to be severe by these people, who hardly know what to do to satisfy their empty stomachs, but it was regarded as the right thing to do to be severe in punishing the first offense. This same Axsegroak found two reindeer from Antisarlak's herd roaming over the mountains south of Port Clarence. He could easily have shot and eaten both of these animals without any risk of discovery, as he lived in a tent with his family far from any other Eskimos, but he came to the station, and relating what he had seen got his reward for doing so.

A week after we had assumed the management of the herd we took it about 3 miles east of the station and a fence was built near a small brook, afterwards called Pen Creek, and the Lapps and the apprentices were sent out to camp there. Since that time the herd and the camp have been moved sixteen times. The dates of the various movings you will doubtless find recorded in the log book, but I will here state that camps Nos. 1, 2, and 3 are the autumn camps down to November; No. 4 is a winter camp until the middle of March, and the other twelve from that time to date. The pastures examined in this connection vary in quality more or less, the best ones being Nos. 8, 10, 11, 12; that is to say, on the south side of Goweerook River. Even better pastures with dry, hard ground have possibly been found on the south side of Grantley Harbor and on the southeast side ot Port Clarence. It is doubtless one of the best pastures to be found in this vicinity. The purpose of moving so frequently was, first, to give the herd change of pastures; second, to examine and find the best pastures; third, to make the reindeer acquainted in a larger stretch of country so that they would not so easily get lost in case some of them should happen to go astray. A reindeer would more easily find its way back to the herd if it came to a familiar place where it had been before. Fourth, and not least,

to make the approaches in moving and in nomadic life, of which more
herder. The moving in the spring was of course done for the pur-
pose of bringing the herd to a place where the females could as com-
fortably as possible drop their fawns. This place had been selected
in the course of the winter.

The first thing I did was to send the Lapps in different directions to
make themselves acquainted with the locality and with the pastures
before snow fell, and when I had acquainted myself in regard to the
conditions of the wind and weather, I decided that the herd ought to
be kept near the station at the time of dropping the fawns. On the
5th of January I set out with five reindeer east of the station to find a
suitable place for the cows to bear their young. I chose the coldest
part of the winter in order that I might be the better able to judge of
the condition of the various places. The first day we drove to Gowee-
rook village, about 45 miles distant. There we spent the night, and
the following day we drove in different directions, but continually
farther up the Goweerook Valley until we reached a place about 10
miles beyond the Eskimo habitation, and from there we returned to
the station. We spent two nights in the snow banks and five nights in
Eskimo tents, and we found what we sought, to wit, a sheltered place
with good pasture. We arrived at the station the 13th of January.

In the course of the winter the herd was scattered only once. This
was the night between the 7th and 8th of February, when a terrific
storm from the north raged so violently that no human being could be
out in it. On the morning of the 8th only 20 of the reindeer were
found to have been able to resist the storm. These were all tame sled
deer. None of the others were to be found, and after eight men, who
in the morning had gone out in different directions to search for them,
returned to the camp at noon, the result was that only uncertain
traces could be found in the snow south of the camp; and when two
men again went out to follow the footprints the herd was met driven by
five Eskimos toward the camp. The whole herd had yielded to the
power of the storm and had started off in the same direction as the
wind. It had wandered across the ice to the south part of Grantley
Harbor to the vicinity of the village, where the Eskimos saw the ani-
mals feeding in the morning, and began to drive them back, meeting
our men on the way.

We began training the deer in hauling sleds before the snow fell. All
but one of the deer which had been used the previous winter as sled
deer, had been sent with the mission herd to Cape Prince of Wales. The
one we had left was an old animal which we afterwards discovered was
able to live on corn meal; that is to say, it was one of the animals which
Miner W. Bruce had been experimenting with in this direction. After
making this discovery, this animal was called the "Corn Meal Sack,"
and it is at present in the Antisarlook herd. About the time the snow
fell in sufficient amount to give us sleighing, we had 5 reindeer that

could be used as sled deer, and we continued training the animals during the winter, so that there are now 27 trained animals in the herd. We have kept from 8 to 17 of these continually at the station from the 3d of November, 1894, to the 16th of June, 1895. These animals have been employed every working day for bringing fuel and lumber to the station. They have been fed on moss, and had their night quarters in a shed built last fall for that purpose, until the middle of February, when the moss gathered last fall gave out. Since that time they have been tethered in a pasture every evening. This involved a good deal of work, as the animals had to be tethered 3 or 4 miles from the station, and the fuel and lumber had to be brought from 5 to 10 miles from the opposite side of the station.

There is no moss to be found nearer than 3 to 4 miles in any direction, from the fact that the herd, unfortunately, had been kept for a couple of years pasturing in the immediate vicinity of the station and had consumed all the reindeer moss, if there ever was any. We often tried to feed the reindeer in new ways, since we at once found that the Eskimos did not have, or were not able and would not for a long time be able, to secure any more corn meal than could find place in their own empty stomachs.

So many animals being needed for daily use, and these having to be changed every three or four weeks, the beginners not being able to stand the prolonged, steady work, it became necessary to train a few 2-year-olds after all the older ones had been brought into service. This practice is not to be recommended, but the Siberian reindeer being somewhat larger and stronger than 2-year-olds in Lapland, and they being handled with the greatest care, I do not think they were damaged in any way. Of the animals trained and in the process of training, 4 had to be or were killed, as you will see from the quarterly statement, and the reason for this was that they were left to the apprentices for practice. As a rule, about 10 per cent of the animals that are being trained will be lost, no matter how skillfully the work is done. Last fall some of the animals were also trained to carry pack saddles. They were used, and are still being used, in transporting the provisions from one camp to another.

The time for dropping the fawns comes one month earlier here than in Lapland. This circumstance, in connection with the fact that the weather is colder all the year around, makes it more difficult to save the fawns here than there. We had been very successful in the change of quarters for the herd during the most important season. A daybook kept by one of the Lapps shows fine weather, continuous calm, while we here at the station were constantly exposed to a cold, north wind, with occasional sleet. In Lapland the fawns are dropped from the beginning to the 10th of May, while here the first were born on the 10th of April and the last on the 16th of June.

It had already been noticed last fall that the dropping of the fawns

here occurred earlier than in Lapland. Hence, every effort was made to arrange for the pairing later than formerly, and I believe we gained a few days; and, which is of great importance, in the month of April. From the report of the first year from this station, it is noticed that the fawns were dropped between the 13th of April and the 3d of June, but we were unable to accomplish much in this direction last year, but next fall another effort will be made to regulate this matter if no obstacles interfere. It was stated last fall, by people who were supposed to know something about herding reindeer, that if we continued in this manner the herd would not be able to live through the winter; but we took but little notice of such predictions, as our Lapps were not infants in the art of herding reindeer, but men who had seen and handled reindeer more than one year.

The reindeer here are more wild and unmanageable than those in Lapland. The reason for this is probably the fact that the Siberians do not train the animals for sled deer, but let them go as they please, simply watching them and keeping them together. In Lapland the reindeer may be seen pasturing among the tents, or perhaps better, a herd of reindeer may be seen with tents in the midst of them. Dogs, men, and deer are mixed together, and it is to be hoped that we will be able to domesticate this Alaskan herd in the same manner by continually working with them and letting the herders, the apprentices, and the dogs stay with them.

From the extract of the reindeer account it will also be seen that at the beginning of the time of calving there were 118 females, 52 males, and 90 fawns belonging to the station; that the increase this year was 118. From this statement it may appear to you that we did not lose any fawns, but this is not the case. In the first place, one cow had two fawns, one of which had to be killed, as the reindeer cows are not willing to recognize twins, but she chooses one of them, feeds and takes care of it, while the other is invariably hooked and kicked and denied all maternal care and nourishment.

Apparently the Eskimos and the reindeer are very much alike in this respect. I was told that the Eskimo also, under similar circumstances, choose one and kill the other of the twins. This is not the only fawn that died. There were more of them, and how it happens that we have as many living fawns in the herd to-day as there are grown-up females is to be explained by relating one of the many methods by which an attempt is made to force the increase of the herd in Lapland. One more fawn is one more reindeer, and one more reindeer is money to the Laplander; hence, many experiments are made in this direction. It is estimated that under ordinary circumstances there must be more fawns than there are grown-up females, and to produce this result some of the fawns that are only 5 to 6 months old are paired. The most of the fawns dropped by these young heifers die, but some of them are saved by careful treatment, both at the time of their birth

MILKING REINDEER.
Photograph by W. T. Lopp.

and later. Some of these fawns are expected to be saved and so take the place of the deceased fawns dropped by mature mothers. We secured this result this year by the aid of the male reindeers which we asked for last fall, and which you landed here the 1st of September, and, to use an expression of the Lapps here, we may say that the fawning and increase has been "barri"—that is, successful. The reindeer are always called fawns until they have passed their second birthday (1 year old).

Last fall we built a fence and made a pen, and then we began milking. This was a most difficult task, as many of the cows had never been milked, and those that had been milked were so afraid of undergoing this operation again that when the lassoing began they started off on a full run, and some of them leaped over the fence. This dread of lassoing and milking was caused by the manner in which they had heretofore been handled during this process. They had been thrown to the ground and two or three men had held them down, lying on top of them while they were being milked. No wonder that such barbarism should frighten the animals. It took a long time before we could get the herd quieted down during the milking, and when the season was over there were only three cows that allowed themselves to be caught without lassoing and stood still during the milking without being held. Still I considered this a satisfactory result for the milking of the first fall.

The reindeer are milked only in the fall, after the fawns have been weaned. From the milk we made cheese. Some of the milk was evaporated to be used in the winter, and although the milking ceased early in the season, the Lapps still had cheese and butter for their bread and milk for their coffee in the middle of March. Our apprentices were altogether too lazy to milk, and consequently they had neither cheese nor milk to use.

We have had but little trouble in protecting the herd from the Eskimo dogs. Only once or twice did they give us any annoyance last fall, and that was before the herd was moved away from the station. But they were driven away by the Lapps' dogs on guard, and from that time we have never seen them approach the herd. On the other hand, we have been somewhat annoyed by the sharp teeth and empty stomachs of the Eskimo dogs in connection with the sled deer which were constantly kept near the station. We had kept the dogs away by threats and sticks, excepting in one case, where a dog was killed by the knife of a Laplander while he was taking care of the sled deer. The dogs in the nearest village are by this time so accustomed to the reindeer that they never attack them, although we have driven directly in front of their noses every day during the whole winter. In the beginning of last autumn there were many wild cries and just as many conflicts between the Lapps with their great knives and the dogs with their sharp teeth. The Lapps were always victorious. On account of their

constant defeat and torn skins, the Eskimo dogs surrendered and have made no more attacks. In defense of his sled deer against wolves or dogs, the Laplander always uses his knife, which is 10 to 12 inches long, a formidable weapon, and he defends himself in the following manner:

As soon as danger is perceived, the Lapp leaps out of the sled and runs to the reindeer, throws them down with the back on the ground, straddles them, holding their heads erect. In this position the animals can not get up. The Lapp holds the head of the reindeer with his left hand, and with the knife in his right hand he is ready for battle. He hews to the right and to the left, and one dog after the other runs away howling with wounds in his skin or even in his flesh. The matter continues in this manner until the number of animals becomes so small that they dare not approach their would-be victim, when the reindeer are released. In less than a second they rise to their feet again, the Lapp leaps into his sled, and only a cloud of snow tells the remaining enemies in which direction the intended victim has gone. In case he is pursued, the process is repeated until all the foes, howling or limping, have become unfit for any further pursuit. Our Lapps tell me that if only one man meets a dozen strong Eskimo dogs that have not before seen a reindeer, he will need all his strength and skill to defend a couple of animals.

With a little care and good sense on the part of the herders there is no danger whatever in regard to reindeer thriving and increasing in Alaska; for, in places where the herds are kept, the dogs soon become accustomed to the sight of the reindeer and will not molest them.

In connection with provisions, we took only nine barrels of salted corned beef with us from San Francisco to be used by the Lapps, but as two more families than expected remained with us at this station, the supply of meat was too small; and to mend this, three reindeer were killed just before Christmas, and the meat was divided and distributed, together with the corned beef, among the Lapps. One reindeer was also killed to divide among the apprentices. One animal was taken and killed by the superintendent, an account of which will be made this summer. An account will also be made of a reindeer that had a little blemish and was sold to the Lapps for food; thus, the number of reindeer killed for food was 6, and all these were males.

If it be true, as reported by whalers, that the provisions for the station will arrive this year by the same brig (*W. H. Meyer*), it will doubtless be long before it gets here, in which case it will be necessary to kill more reindeer for food, as we have no meat left from last year's supply for the July distribution, which takes place the 4th of July.

In accordance with your instructions that the tongues of the animals killed should be prepared for market, the tongues of the 5 reindeer killed were smoked; but the tongues of the 6 that died, or were sick and killed, were not prepared in this way, but together with the rest of the meat, they were appropriated to the stomachs of the apprentices, in which market there is always a large demand for such things.

LAPPS AT TELLER REINDEER STATION, ALASKA.

Photograph by William Hamilton.

The antlers which have been shed have been collected, and await the arrival of the apparatus for making glue. The herd has constantly been in excellent condition, and at this writing the new antlers are from 12 to 20 inches long, the best possible evidence of thrift.

It may be stated here that, taking all the circumstances into consideration, the wintering of the herd and particularly the increase have been entirely successful.

HERDERS AND APPRENTICES.

As you doubtless observed during your visit here last fall, our Lapp herders did not receive the warmest welcome from the people who are supposed to have influence among the Eskimos. It may be stated that the importation of Lapps was the most sensible measure that could have been adopted in connection with the reindeer enterprise in Alaska, for in this, as in all other things, a good beginning must be made if the end is to be good. The necessity of importing Lapps and the improvements thereby secured will be plain to you and to anyone who will take the trouble to read this report. The dissatisfaction was expressed and shown distinctly on every occasion. It was soon learned that the dissatisfaction and the variety of stories concerning the Lapps had spread among the Eskimos. This fact was plain, from many expressions made by the apprentices. It became necessary to make it clear, both to the apprentices and to the other Eskimos, that the Lapps were an intelligent and skilled people, both as regards taking care of reindeer and as to other things.

There was some anxiety on account of these strange relations which had sprung up without any cause whatever, and I was uncertain as to what it might lead to in the long run. Good relations between the herders and the apprentices was of paramount importance in securing a good result, and such a good understanding had to be brought about even if one of the sides had to make some sacrifice. When the Lapps had become informed in regard to the cause of this strange relation and its want of respect for them as if they were incapable and useless, it was made clear to them that the only way to gain the respect of the Eskimos was to demonstrate their superiority in fact, and they lost no opportunity of showing these people how superior they were in every respect. I am glad to be able to report that the relations very rapidly improved, particularly between the Lapps and apprentices, and the feelings between them have grown better day by day. The apprentices, at least most of them, have long since discovered their inferiority and seen how much they have to learn from these people. We have now reached a point where no apprentice undertakes to do anything before he has consulted one of the Lapps, so far as the languages make it possible.

The relations between the Lapps and outsiders are also pleasant, for the Lapps have often given valuable assistance and pointed out how

this thing or that ought to be done. They have undertaken to treat the natives as grown people treat children, and nobody will this year succeed in filling the heads of the Eskimos with stories about the Lapps, and the only outsiders among the Eskimos who still believe themselves to be superior to all others, not only to the Lapps, are the people from Cape Prince of Wales who occasionally have to come here with their seal skins and other things to exchange them for ammunition and provisions. They show by their conduct that they regard themselves as superior, but the only thing in which they are regarded as being superior and in which they actually excel all others is begging. They have studied completely the various kinds of beggars' tricks, and practice them both orally and in writing. The Lapps have occasionally been deceived by the lamentations and tricks of these people, but their dishonesty has usually been detected, and when the dishonesty has been discovered, then neither the Lapps nor the rest of us understand a word they say, this being the best way of getting rid of them. Usually they have received something to eat, and their hypocrisy has been used as the source of amusement.

I am very happy to say that the Lapps have hitherto conducted themselves most excellently, and have submitted with alacrity to the rules and regulations made for them, rules and regulations which they have never had to submit to heretofore. The only thing with which they have expressed any dissatisfaction is that they have not received as much reindeer meat as they would like.

The Lapps have certainly done everything that they possibly could, not only in taking care of but also in instructing the apprentices. So far as the language has permitted, they have always been willing to explain why this thing or that had to be done in this way or that way, and why things should be done at a certain time. This applied both to herding, to milking, to driving, to training, to the making of sleds, harnesses, saddles, skees, cheese, tanning and the preparation of skins, and to the proper use of reindeer hair, antlers, etc. When we arrived at the station it was assumed, both by the Eskimos and by the white men at the station, that reindeer skins could not be tanned or prepared so as to be made waterproof, and that people would always have to depend upon the seal for their waterproof boots. The opposite has now been demonstrated so many times by the Lapps, they having shown how completely dry their feet were after standing in water above their knees for hours at a time, that the Eskimos now see that the seal can be spared from this use, since there are a sufficient number of reindeer skins to take their place.

When you left us last fall we had the following apprentices at the station: Moses (an Indian), Martin Jacobson, Tatpan (Herbert), Akweet koon, Soo wa wha sie, Antisarlook (Charlie), Kum muk, Sekeog look, Oo kwood let, To oo tuk, Ohlook, Alektoona, Wok sock (Eskimos).

Of these thirteen apprentices three were married and had their

families with them at the station. At this writing we have only nine of the above thirteen, four of them having left us. Two of these were discharged, as they were utterly unfit for herding. They took no interest whatever in it and had no desire for it, and had not come to the station for the purpose of being herders, but had come only to stop there for a year, and having received a good living and been supplied with good warm clothes and earned a couple of animals, then to sell these and get back to their homes, warm, well fed, and with a little fortune, say $20 to $70 in personal property, which they then would sell to other Eskimos, and in this manner live another year without work. From their standpoint, this may be regarded as a successful enterprise. The two thus discharged were Oo kwood let and Soo wa wha sie. I presume there are a couple of other apprentices who have come here with the same purpose in view, but they do not talk the way the others did. These ought probably to be sent away, but this has not hitherto been done for reasons that will appear when I come to discuss the qualifications of the herders individually.

It was thought best to have the apprentices remain with the herd; that is to say, they ought to remain in camp where the herd is pasturing, be it near or far from the station. They ought not to have the station as their headquarters and go out once or twice a week to look after their watch, in which case they would look upon their work as herders as a secondary matter, while it ought to be uppermost in their thoughts. Then they would never become habituated to living in camps and moving, a matter which is absolutely necessary for every reindeer herder.

Nomadic and camp life both summer and winter must become such a habit that it can not be abandoned without sorrow, before anyone can be said to be entirely familiar with, and thoroughly trained in, herding reindeer. Any person who desires to become the owner of reindeer must first become a nomad. In order to begin to harden and accustom our apprentices to this sort of life, they were sent into camp with the herd immediately after I took charge of the station and since that time they have been kept in tents continually, even during the pretty severe weather in winter. They would take turns at coming to the station every Saturday, but would be sent out again the following Monday with the necessary provisions.

My instructions were that the apprentices and herders should be divided into two groups, of which each group should be kept near the herd for four months at a time. In this a little change has been made, as four months would be a rather long season for the first time. Nor would this divide equally the seasons of the year. I therefore let the apprentices stay out four weeks at a time and the herders three months. At this writing, we have advanced so far that a few of the apprentices have begun to take an interest in the herd and in camp life. They like better to be out with the reindeer than to stay at the station. Others, on the other hand, can not be made to understand that in order

to become good herders they must first become nomads and take an interest in handling, watching, and being among the animals all the time. They also appear not to understand that when an order is given to them to remain in camp for a certain length of time, the intention is that they must not run away from the herd every other day to see what is being done at the station. It has been necessary to administer many a disagreeable reprimand on account of the violation of this order. On the other hand, it must be stated that it has been very difficult for the apprentices to obey our rules, since they were so accustomed to look upon the station as their headquarters.

To keep them in camp various means have been resorted to, but without any other result than that they would return to the station and have to be sent back again. We, of course, refused to give them food when they came from the camp. My last resort was to set them to doing hard work when they came to the station, and as they have a dread for this sort of punishment they usually dropped the work quickly and ran back to the camp. Sometimes they run away to some Eskimo village instead of going to the herd. They may stop for a day or two in the village and spend a day with the herd, and then come back to the station with an artega, "a coat," a boot, mitten, or sock torn, as an excuse for leaving the herd.

On reading this you may probably say, "Send them off," and this I have thought of doing, but as their time has so nearly expired, and as they have been kept thus far and by my predecessors, it seemed to me that they might be tolerated a few months longer. It is unfortunately a fact that the apprentices here mentioned are chiefly such as have come from some mission station and there have obtained their taste for warm rooms.

I do not say this with a view of finding the least fault with the mission stations or with the work of the missionaries among the Eskimos. On the contrary, the missionaries surely, here as elsewhere among heathens, do all in their power to civilize these people and to win them away from dirt and ignorance. And it is not the fault of the missionaries that the Eskimo boys ignorantly make up their own minds about matters, especially before they have been at a station long enough to be able to form a higher estimate of life. The apprentices who are taken directly from the Eskimo population, and from the Eskimo hut, are far better, for they understand that they are better off both for the present and for the future if they take hold earnestly and do their best to become good reindeer herders. Although this is a matter which I shall discuss more fully later on, I take the liberty of calling your attention to it here in connection with the employment of new apprentices.

Hitherto it has appeared that the married men—that is, those who have families here—are the most reliable, and they seem to have some idea of the responsibility in regard to what they do, and at the same time they are the cheapest for the station, inasmuch as the additional food required by the wives and children is compensated for by their

requiring less clothing. The women look after and mend the clothes, not only of their husbands and children, but also of the other apprentices, and prepare their food.

I shall now mention in detail and make a few remarks on the qualifications of each apprentice separately, and I shall present them in the same order as that given in the above list:

Moses. He is the boy that came from St. James mission, on Yukon River, in 1893, and who was not accepted as an apprentice by the then superintendent, Miner W. Bruce. Mr. Bruce very properly refused to accept him on account of the boy's peculiar character, but he was accepted by the superintendent, W. T. Lopp, which probably was a mistake. It was thought best last fall to let the boy go at once, and so Capt. M. A. Healy was asked to be kind enough to take the boy to St. Michael, the boy stating that he could get home from that place at any time, but Captain Healy declined taking him, although the boy had spent the winter at the station and proved himself a great annoyance to everybody. He could not be sent away in the dead of the winter, as he was far away from his home and could not get to it in the winter season, nor could he be turned out among the Eskimo, who do not feel friendly toward the Indian. A letter was sent to Mr. W. T. Lopp, the present manager of the mission station and of the herd at Cape Prince of Wales, asking whether he would take Moses and keep him with his herd, as it was supposed Mr. W. T. Lopp was fond of the boy and had favored him above others at this station a year ago, but Mr. Lopp refused to receive the boy, and it only remains to be said that he will be discharged and sent home the first opportunity, and the reasons for the discharge have been stated in a letter already written to the St. James mission, being as follows:

> He is too expensive for the station, too smart for the people, too dudish for the other apprentices, too rough for the children, and too lazy to become a herder.

Martin Jacobson came to the station in January, 1894, from the Swedish mission station in Unalakalit, and is much easier to get along with than Moses, but he takes no interest whatever in his work with the reindeer. He is pretty clumsy in all that he attempts to do and thinks himself too smart to obey orders and to begin work as a herder, but I think he has a sound judgment and that he has a liking for work in the school.

Tatpan (Herbert) came the same time as Martin Jacobson and his home is in Golovin Bay or Unalaklik. According to a letter he brought with him he was sent here on the recommendation of Capt. M. A. Healy and has now left the station, being at this time one of Antisarlook's herders, while his two reindeer are still in our herd and will be sent with the herd that goes to Golovin Bay, where Tatpan will continue as herder. His qualifications for becoming a herder were fairly good and it may be presumed that some time in the future he will be able to take charge of his own herd.

Akweet koon came here at the same time with the last two, and belongs to Golovin Bay. He is well qualified for his work, but has to be watched constantly. He is industrious when he is observed, and he seems to like to drive and train the animals, which is a good indication. But if it had not been decided to send a herd to his home, both he and Martin would have been discharged before this, and better qualified persons secured in their places.

Soo wa wha sie presumably came in the autumn of 1893 from Nome. His qualifications seem to fit him better to become a great doctor in this region rather than a herder. The Eskimos say that he was born to be a doctor, as they know from certain marks on him. This is probably the reason why he did not take much interest in the life of a herder, and so he was discharged and sent home after he had been found guilty of a few small thefts.

Antisarlook (Charlie), from Point Rodney. I do not know at what time he came to the station. On my arrival at the station he was quite ill and puny, and hence I could not set him at any hard work. He was soon to take a herd of his own, and he needed all the strength he could gather before taking charge of his own herd. He had good qualifications as a herder, and a fuller report of him will be given in connection with his own herd.

Kum muk. I do not know how long he has been at the station, but he probably was appointed an apprentice at the time when Mr. W. T. Lopp assumed charge. He had been sent here from the mission station in Cape Prince of Wales, and would have gone back to the same station together with the other apprentices last fall, when Mr. Lopp appointed him to remain here through the winter in order that he might have an opportunity to see how the Lapps take care of the reindeer. He is married and has two children. He is reliable and gives entire satisfaction in every respect. He is as well qualified as anyone found among the Eskimos. With the reindeer he has already acquired, he will be sent back to the mission station to continue his life as a herder there, his two-year term as an apprentice having expired.

Sekeog look, from Synok. In 1893–94, he worked as an apprentice by the month, but this system of keeping apprentices was not in correspondence with the purpose of the school for herders here, and, desiring the change himself, he was, last fall, accepted as an apprentice on the usual terms; that is to say, he was to receive reindeer as his compensation. He is about 26 years of age, and is one of the few boys who are found to be reliable and satisfactory. He has excellent qualifications for becoming a herder, but takes very little interest in driving, taming, etc. The chief thing is to be a reliable and competent herder, and this he will certainly become. He is industrious, willing, always obedient, and executes every order promptly.

Oo kwood let, from Port Clarence. When we arrived he was a boy scarcely 14 years old and in poor health. On the 11th of October, hav-

ing earned his two reindeer, he was sent home. His object in coming to the station was the same as that of Soo wa wha sie—to wit, to get a good living for a while. Considering that he was so young, this might be expected.

Ta oo tuk, from Poleyrook, apparently was received here in the autumn of 1893. Judging from the number of reindeer which he is said to own in the herd, I take him to be a brother of Oo kwood let; and for this I have good reasons, for they resemble each other very much in looks, while in all other respects they are very different. He was not married when I arrived at the station, but in the course of the winter he married Nab sok ka. The matrimonial knot was tied by Rev. T. L. Brevig. Ta oo tuk is an excellent huntsman, but doubtful timber for herdsman. Then there are a number of little things concerning him which I have not mentioned in this report. I have not yet decided what to do with him. His apprenticeship expires next autumn, and it will then be determined what it will be best for him to do in the future.

Ahlook, from Point Hope, was left here by you as an apprentice the 20th of August, 1894, to take the two years' course in herding. He has proved himself a worthy young man, and has already exhibited great interest in the care of the reindeer, and he is reliable in the performance of his duties as a herder. His choice was a happy one, and there can be no doubt as to the propriety of permitting him to take charge of a small herd, particularly if there could be somebody with him to look after business matters, or, in other words, to see to it that everything was done in the right season. Ahlook seems to take no note of the time, particularly when he is with the herd. He hardly remembers when it is time to eat, a thing never forgotten by any of the other boys at the station. Of all the apprentices he and Sekeog look are the very best and most reliable herders, and if he has to chase around the herd some foggy night until daybreak he does not look upon this as much trouble, providing he succeeds in having all his reindeer safe in the morning when the time comes to change the watch.

E lek too na, who was brought here by yourself on the same day with Ahlook, is also from Point Hope, but his selection can not be said to have been a happy one, and he has been kept on the to-be-sent-home list all winter. He has made some improvement lately, and just now his name has been taken off the list.

Wok Sock, from Goweerook, was received as an apprentice last fall after I arrived. He is married and has three children. His qualifications for the work of a herder are good, and if he continues doing as well as he has begun he will certainly become an excellent, intelligent herder, in whose hands a herd in the future will surely thrive and make progress. He is reliable, always active, never evasive, never runs away from any order given him, but he does everything exactly as he is told, and seems never to be entirely satisfied himself with his work. He is the only one who reports and asks for new work when

his task is done. He has a great deal of common sense. He and Kum Muk have at times kept the watch without any herders, and everything has been satisfactory, even during the season when the fawns are dropped.

This description of the qualifications of the apprentices will be of some use to them when they find out that their conduct and their industry is mentioned outside of the station, but to what extent it will be useful to me is somewhat doubtful. I am obliged to tell the naked truth, and that is sometimes hard to hear, both for the Eskimos and for others. The following ration list will exhibit to you how our people have been treated. The list here given has been followed throughout the year, excepting as to the potatoes, which froze and became useless.

Ration list for herders and apprentices at Teller Reindeer Station, Port Clarence, 1894–95.

[Four weeks' ration.]

Name and number in family.	Flour.	Butter.	Meat.	Rice.	Peas or beans.	Potatoes.	Soap.	Molasses.	Matches.	Navy bread.	Coffee.	Sugar.	Tea.
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Qts.*	*Boxes.*	*Pcs.*	*Lbs.*	*Lbs.*	*Lbs.*
Johan Spimsen Tornensis, wife, and one child	60	9	40	5	5	40	1	2	10	50	.....	.....	.....
Mikkel T. Nakkild and wife	60	8	40	5	4	40	1	2	10	60	.....	.....	.....
Samuel T. Kemi, wife, and one child	60	8	40	5	5	40	1	2	8	60	.....	.....	.....
Aslak L. Loneby, wife, and one child	65	9	45	5½	5½	40	1¾	2	8	60	.....	.....	.....
Mathis A. Eira, wife, and one child	65	9	45	6	6	40	1¼	2	8	60	.....	.....	.....
Per. A. Rist	30	4	20	2½	2½	20	½	1	10	30	.....	.....	.....
Frederik Larsen	30	4	20	2½	2½	20	½	1	5	30	2	2	½

REMARKS.—They are furnished all the fish they want. The navy bread is given when they come from camp on Sundays to go to church and bring no food with them. If no rice is to be had they are given rolled oats instead.

For Eskimo apprentices and their wives and children at Teller Reindeer Station, Port Clarence.

[One week's ration. Two children get one ration.]

Flour	pounds	6
Navy bread	pieces	40
Tea	package	½
Molasses	quart	½
Beans	pounds	3
Rice	do	2
Soap	do	½
Corn meal	do	2
Matches	boxes	2
Meat or pork	pounds	4

REMARKS.—They are given all the fish and seal oil they want. Beans given one week and rice the next week. Seal meat is not weighed, as they get all they want during the season. Tobacco is earned by those who work overtime, after January 1, 1895. One-sixth pound of tobacco given a week until January 1, 1895.

It was thought best to give a certain ration on a fixed time, so as not to have the disagreeable disappointment of finding that the supply of provisions had given out in the middle of the winter. With this in view, a quantity of the various kinds of provisions was calculated and

a list made out accordingly. It was found in going through the supplies that some things were not sufficient to last through the year, consequently such things, as you will notice, were distributed only every other week. On alternate weeks another kind of provisions was given out instead. In this way, and by using all the fish the people could eat, and by bringing some provisions from Golovin Bay, our limited supply proved sufficient. I think it must be admitted that the rations actually given out satisfied the people.

Both the herders and the apprentices have been well and warmly clad, so that they could be out of doors at any time and in all kinds of weather without suffering. The kind and quality of clothing you will find under the account of each individual and also the cost of the same. I find in your instructions that all the apprentices were to receive the same amount, so that no one might get more than his share, but I have not been able to live up to this, since one man sometimes absolutely needs what is not required by another. Hence I find it much better to let each one have what clothing he actually needs without giving the same article to others who did not need it, but no great difference on the average will be found in the treatment of the different individuals.

THE HERDERS' DOGS.

As heretofore stated, we brought with us from Lapland 10 trained dogs, 5 pairs. Only 9 of these reached the United States and only 8 of them San Francisco. On the other hand, the number was filled on our arrival at Port Clarence, 2 pups having been born on the way. One of these pups was given to Captain Holland, so that we had 9 when we landed at the station. It was difficult to tell who was the most pleased, the Lapps or the dogs, at once more setting foot on solid earth and at seeing reindeer. But if the running and barking are to be taken as evidence, the dogs appeared to have had the greatest pleasure. The fact that the dogs were happy was also noticed by the herd when it, after being imprisoned for months, was set at liberty and ran by the side of their enemies. The reindeer here never before having been watched with dogs were quite unmanageable in the beginning, as they also looked upon these dogs as their foes, against whom it was necessary to defend themselves. For this reason the dogs had all they could do to save their skins, and there was many a race between a reindeer and a dog, the dog in front and the reindeer trying to get near enough to use its antlers on his enemy, but these races always ended by the reindeer becoming weary of the pursuit. The deer thought it had put the enemy out of harm's way, but no sooner had it turned before the dog again was at its heels, and now the race was inverted, the deer being chased by the dog.

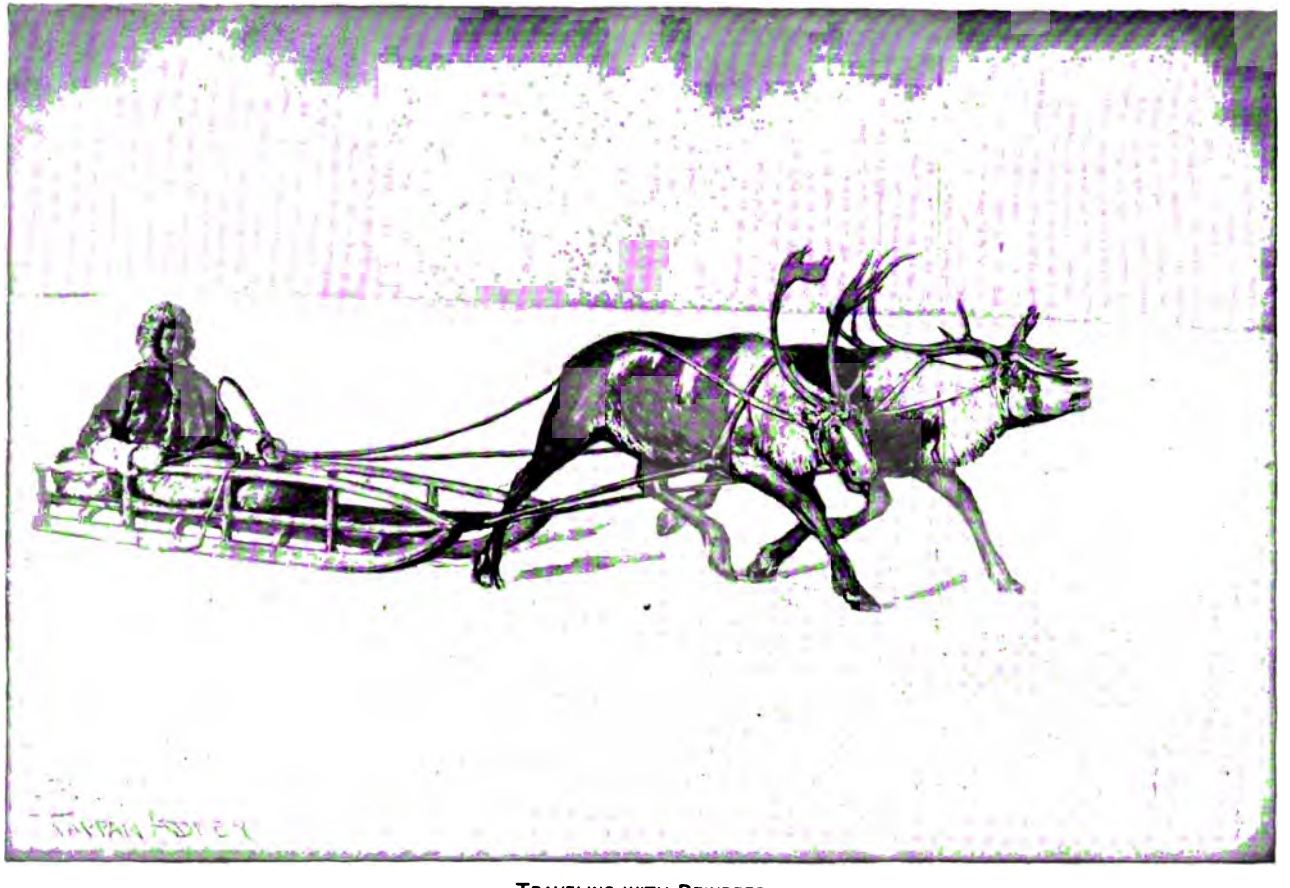
This experiment was repeated again and again hundreds of times until the dog became too weary to do any more work, but there was always a new lot of dogs to send out and take the place of the exhausted

ones, so that the reindeer finally had to yield and submit patiently to the barks of the dogs. At first the herd could not be driven in any given direction with the dog. All the dogs could do was to keep the herd together. The apprentices seemed well pleased with these dogs and apparently liked them much better than they liked the Lapps. Being asked how they liked the Lapps after having been with them on watch the first night, they answered that they liked the dogs very well, as they now did the running in place of themselves. Now the apprentices are unwilling to get the herd without a dog, as the dogs have perfect control of the herd, a result gained after two months' barking. The herd can now be driven in any direction desired, straight or in a circle.

It has given us much trouble to keep the blood of these dogs pure from mixture, as there is an endless number of dogs and races of dogs in this region. So far we have had complete success. The only mixture that has taken place is with a Scotch collie she dog brought by you. The offspring of these two breeds of dogs promise well. There are now two of these bastards being trained with the herd, and they appear to be very peaceable and careful with the animals. Only one of the collies brought here is kept at the station. The others, together with the half-breed collie and Eskimo dogs, were intended to be killed; but when Mr. W. T. Lopp wanted them they were all sent to him—that is, to Cape Prince of Wales. The females of these were sent back to the station in the course of the winter to be paired with the Lapp dogs, and in due time they were returned to Mr. W. T. Lopp, who now has a sufficient number of dogs of the right kind with his herd. One pair of the Lapp pups were sent to Antisarlook's herd and one pair are now being trained to go with the first herd to be sent away. In addition to this, we still have a few pups that will be given to the apprentices, and we will continue in this manner until everybody is supplied. But it is doubtful whether the apprentices and the other station will be able to keep these dogs from becoming wolves by getting mixed with the Eskimo dogs, for the ability to do herding is lost by this kind of mixture. The offspring become carniverous and not herding dogs. This is to be proven by the half-breed collies and Eskimo dogs that were here, but there will always be an opportunity of getting full-blooded dogs from this station as long as we have full-blooded stock.

SLED DOGS.

We could find no use for these on our arrival here, and consequently decided to sell them, but partly on account of the assurance of the people here who were acquainted with the character of our winters, it was presumed that we might find these dogs useful in the course of the winter, and so we kept four of them until the time came when they might be needed. Meanwhile, as the winter passed and no occasion was found on which the reindeer could not be used, the sled dogs,



TRAVELING WITH REINDEER.
By Tappan Adney. Published by the courtesy of "Our Animal Friends."

together with some other things, were given to Antisarlook as a starting outfit in life. In the course of the winter and spring we found no use for the dogs. All our work could be done by the aid of the reindeer. In May and the first half of June, when we had the best roads for hauling lumber and fuel, dogs could not be used on account of the icy crust of snow, which was too sharp for the dogs' feet, cutting them to the quick, so that they could not walk, much less haul loads.

The only time when dogs can be made useful at the station is in the summer, and the only use they can be put to is to haul rafts of lumber along the shore. For this purpose we have now procured six dogs. These will be sold in the autumn, as we have no use for the dogs during the winter. Dogs bring a higher price in the fall than in the spring, so that we get the work done during the summer for nothing.

No progress has been made in regard to harnesses; that is to say, we have used the same kind as are used in Lapland, which is an improvement of more than 500 per cent on Siberian harnesses heretofore used by this station. This harness is perfectly satisfactory for common use. Until we get new and hitherto unknown ways of training reindeer, any change in the harness is not necessary, nor have we had much time to think of this matter. When you emphasized improvement of the harnesses in your instructions you doubtless were not acquainted with the appearance and excellence of the harnesses now in use at the station, but had in your mind the Siberian harnesses. It would be of but little use to describe the Lappish harnesses; they must be seen and used in order to be appreciated. I may state briefly that they are very much like the shoulder harness used on horses. Of course allowance is made for the restlessness of the reindeer, which keeps jumping up and to the side much more than a horse. In the case of the horse harness the principal weight is put upon the brace and lower part of the shoulder, while in this harness the principal weight rests on the upper part of the shoulder and on the neck, where the reindeer have their strength, like oxen, and while training and partly while driving we have employed tugs like those used in driving horses. The only change made in the manner of driving is that two animals are placed side by side drawing the same sled. The country and the absence of trees here permit this kind of driving. In Lapland this is not possible, but the reindeer has been hitched in the American and not in the Siberian fashion.

According to the Siberian fashion of hitching the reindeer to the sled, one animal is placed about 1 foot in front of the other, and the harness is worn in such a manner that the animal draws with only one shoulder, which makes it run with its side instead of its head in front. We hitch the deer by means of two equally long tugs fastened to a whippletree at the front of the sled. Then there is a strap 18 inches long fastened to the halters of both the animals. This keeps the animals side by side and makes them draw with both shoulders and the neck,

and makes them run with the head and not with the side in front. Our harnesses have also been examined, discussed, and tried by the other white people in Alaska, and all agree in regard to their excellence. I do not know whether our pattern of harnesses has been used at Cape Prince of Wales, but two sets of harnesses have been made for our apprentices and sent up there. It is probable that the Siberian harnesses improved by Mr. W. T. Lopp are used there, as everybody is inclined to like his own patent best. Antisarlook used the harnesses made at this station, and he received two sets on his departure. He says: "It is plenty good; Siberian not good."

David Johnson, instructor at the mission school in Unalaklik, who last winter made a missionary journey along the coast up to Cape Prince of Wales, on which journey he also paid us a visit, has tested various harnesses used in training and driving oxen, and on the 19th of April, 1895, he wrote me as follows:

Since I came home I have been busy training the bulls. I had Laplanders' harnesses made for them. I drive them with double lines, but single traces. Tried the yoke and the old Laplander harness, but found the one that is in use now worked best.

As Mr. David Johnson is well acquainted with all the ways of driving in America, both with oxen and with horses, and is familiar with all the different kinds of harnesses, and doubtless has tested all, he finds that the Lapland reindeer harnesses are the best also for oxen—a matter in which I entirely agree with him. I think it would therefore be a good thing if some American farmers, in localities where oxen are extensively used, would try this kind of harness, and I have no doubt that it would produce a great revolution and improvement in the manner of driving oxen in America. Of this I have not the slightest doubt. The Lapland harness is certainly better than the yoke or any other kind of harness, both for animals and for driver. It is not claimed that we know more about driving than people do in America, but it should be remembered that the people who have reached this result with harnesses are a nation who for hundreds of years have had to depend upon draft animals resembling oxen, and as a consequence they have made many improvements. The harnesses were tested for years before they were finally adopted, and the result has been the adoption of the harnesses now in use.

Looking at the matter from this standpoint, it is fair to presume that an improvement would come from such a nation if it is to come at all. In America all the attention has been concentrated on improving the harnesses of horses, and the results have been highly satisfactory, while it is doubtless true that the harness of oxen, particularly in later years, has not received the attention to which it is entitled. The harness of oxen ought to be considered so long as this animal has to do the main work in clearing the land. From the work list, which I send you, you will be able to see how both the herders and the apprentices have been employed during the year. In order that the various kinds of work

and instruction might be somewhat equitably divided, it was thought best to keep an account, made up every month, and followed through the week. At the end of the week it would be added up so as to show how many animals each man had lassoed and milked; how many miles each one had driven.

From the list it will appear that some of the Lapps have been kept at the station more than others. The reason for this was that these were best qualified for various kinds of work—that is, for making harness as well as for making sleds and for preparing materials for building, for tanning and preparing skins, for driving and training animals, etc. For training animals, Mikkel Josefsen Nakkila and Johan Speinsen Tornensis are the most competent, not only in Port Clarence, Alaska, but also in Kontokeino, Lapland. Hundreds of reindeer have been left with them by the other Lapps to be trained, the owners being less skilled in this branch of reindeer industry. In Lapland it is customary to give the one who trains the reindeer the free use of it for one year—no small consideration, as they there have an opportunity of carrying passengers and transporting goods at so much per mile—a very profitable business. From this it may be seen how important it is considered to have the sled deer well trained, in order to get the best results from the capacity of the animal to do work.

The Lapps who have been kept with the herd most of the time have several strong points in herding, in being careful and attentive to its wants, and among them I must mention Per Aslaksen Rist. He is regarded as the most reliable and careful man for herding reindeer. Such also was his reputation in Lapland, where he was intrusted with local offices, being a member of the board of supervisors and member of the court of consent. He is also the best of our herders and a man who in Lapland always owned his own and still owns a herd of 1,150 reindeer. It seems that his statements and views in regard to the moving of the herd, in regard to the quality of the pastures, and in regard to matters in general are law to the other herders and to the apprentices. They never contradicted him in such things, but quietly recognized his superiority in this field. To this must be added his great talent for managing a number of subordinates, a quality which he has acquired by many years practice in Lapland.

As I have heretofore informed you, this man did not come simply for the purpose of adding a few dollars to those which he already owns, but also for the purpose of making observations in regard to the Alaskan reindeer enterprise and to get acquainted with the climate and other conditions. If it should become necessary for some of the Laplanders to emigrate from Lapland, it will doubtless rest with him to decide whether or not the emigrants are to go to Alaska.

The other Laplanders, to wit, Aslak Larsen Somby, Samuel Kemi, and Mathis Eira, are also excellent herders. Aslak Larsen Somby and Mathis Eira are also thoroughly schooled in fishing, so that both the

apprentices and the other Eskimos have the opportunity of learning many new and better ways and methods of catching fish.

In addition to the people named in the list of workmen, the writer has also taken part in making sleds, harness, and in building. I also built an ice boat which drifted out of the harbor on the ice last November. It has been reported that the boat was found by the Eskimos a few days later and was stripped of the sails and iron without sending any information in regard to the discovery. Everything was stolen and a settlement will be made with the thieves as soon as they are caught. I have also made a boat 20 feet long used in fishing, and T. L. Kjellman is at present engaged in building a small boat.

My spare time has been devoted to tanning hides and skins and to a thousand and one different things, so that my time has been too short, even during these long summer days.

It has been said that the Eskimos lose their respect for laboring white men. My view of this matter is different. In the first place, the Eskimos would be apt to continue the work in their own awkward manner and never really acquire any of the easier methods of civilization, unless they see good work done. The result of this is that they never will become able to support themselves in any other manner than they do now. That is to say, they will make no progress excepting in reading, an acquisition which they do not value very highly when their stomachs are empty and require more fish. In the next place, I believe that respect is more easily maintained even if the superintendent works from morning to night. The fact that he labors and constantly keeps himself employed, doing something or other, gives a valuable example to those about him. The industry of the superintendent makes the Eskimos understand that a living is the reward of labor, and that it is not birth or color of the skin which makes a man, but his work and his conduct. We have secured all the respect that can fairly be demanded of uncivilized men, and no order has ever been directly neglected, though there may have been some indirect evasions, but I think the most of them have learned by this time that it is useless to try to disobey an order directly or indirectly. The Eskimos have also been convinced that it is best to be obedient and do what is asked of them, and they have often thought that no more is required of them than they can easily perform. With a few exceptions, their conduct has been entirely satisfactory, and matters are progressing without any serious jars.

The result of catching seals has not amounted to much, and I doubt whether a continuance of it will pay. On the 12th of October six of our apprentices were sent out to Point Spencer, where the catching of seals had then begun. They were well equipped with good rifles and ammunition, with other implements, and with provisions for two weeks and equipments superior to those possessed by any chief for the same purpose. On the 26th of the same month they returned with 5 seals,

ARCTIC SUNSET, SIBERIA.
Photograph by William Hamilton.

which was the result of two weeks' work by those men well equipped. For the killing of these 5 seals they had used 175 cartridges. When we add to this the provisions and the ammunition for a shotgun, these 5 seals become pretty dear. From the list of purchases it will be seen that the 5 seals could have been bought for about $4.

On the 31st of the same month I equipped and sent out a new company consisting of five others of our apprentices, but these had to return by land on the 2d of November on account of unfavorable conditions of the ice. The whole bay was filled with ice so that they could not get to Point Spencer. After the ice had become sufficiently solid expeditions would be made now and then to the edge of the ice about 10 or 12 miles from the land, and the result of all these expeditions was the capture of 2 seals. In the middle of February, when the winter sealing takes place near Polayrook, between Cape Prince of Wales and our station, I sent out an expedition consisting of three of our best sealers. This expedition was gone five weeks, during which time they got just one seal, and this one they had eaten before they came home. On their return they informed me that 150 cartridges which they had used in killing this one seal had not been used for this purpose, but had been given to the father and brother of the apprentices. Once more, later, I tried to send a man out, but he had no better luck than the others, and after an absence of two weeks he returned without any seal. In June our apprentices shot 4 seals near the station.

The fishing did not amount to very much last fall, for we arrived here too late. The salmon fishing had already ended, nor did we bring any suitable fishing tackle, and none such was to be found at the station. Still we made a few salmon seines and with them we caught enough for our daily use. The Eskimo apprentices had no way of securing fish and had to get their daily wants supplied from fish caught by the Lapps. Later in the fall a selection from all the different nationalities were sent up to the lakes, and they brought back some tomcod and some herring, and of the herring enough was salted to supply the wants of the Lapps during the winter.

In the course of the winter three different kinds of seines were made which will be used for catching fish this summer, and I think that a winter supply of fish will be secured. This will involve a great saving, since meat and fish are very expensive. One of these seines has lately been used. The ice drifted from one side to the other, leaving an open body of water. The ice may be said to have been gone since the 27th of June. With this seine we have caught a considerable amount of tomcod, not only enough to keep our Eskimos constantly employed in dressing and drying them, but also enough to give the other Eskimo families, who have their tents here on the seashore, all they want; and so the latter also have been busy hanging up fish to dry for their winter supply.

As this work of catching fish is done in the evening after working

hours, and as it does not take more than an hour at a time, we are going to continue it until we have caught all we need for our winter supply. It is not much trouble to run down to the beach and haul from 30 to 40 barrels of tomcod ashore, but for the Eskimos with their primitive implements it would require a whole summer's patient toil to secure this amount of fish. When we take into consideration that the existence of these people during the winter depends upon the amount of fish they can save in the summer, it is no wonder that they are very grateful when they receive 30 to 40 barrels of fish at a time as a present. In my recommendations I shall have something more to say about the fishing near the station.

Of visits to other herds, I have made only one, partly because it was not found necessary this year and partly for other reasons which I will mention later on.

As heretofore stated, I sent, in accordance with your instructions, a herd to Cape Prince of Wales last fall. I have not visited this herd since and know but little about it. The reason why I did not make a visit there is partly that the herd was managed by a man familiar with the care of reindeer—a white man—and also that the distance is so short, only 60 miles, and the intercourse between these two places so lively during the winter—that is to say, for Alaska—that every change and everything done at this station and with our herd is at once found out at Cape Prince of Wales, and in this way any improvements made here can be adopted there. That herd was given to the mission station unconditionally, permitting the manager there to do as he pleased with the herd, his only obligation being the making of an annual report to the Bureau of Education. I did not find this unreasonable, but it determined my action in regard to visiting that herd. In your instructions you probably intended to omit this herd so far as visiting on my part was concerned.

Antisarlook's herd was sent with a Laplander as chief manager during the moving of the herd, but it was not regarded as necessary or even desirable to have Laplanders continue to manage the herd. The object was to find out what the Eskimos could do when they were left entirely to themselves to manage and plan as they pleased. The purpose was to see what they would do when both the responsibility and the work and the profit were left to them without any interference.

The Lapp and two other apprentices returned to the station as soon as the herd and the camp had been established. There was no risk in leaving everything to the judgment of the Eskimos, as the distance between Antisarlook's herd and ours was only 30 miles and the means of communication, the dog sleds, were in constant use, so that in case anything should go wrong we could reach that herd in half a day and assume its management, but this did not become necessary.

Between the 6th of February and the 13th of March, Antisarlook's herders had no help whatever from the station; not a word of advice

in regard to the herd, and yet they had done everything to my complete satisfaction. The only thing that they had not attended to, but which they doubtless had understood, was that they kept the herd in a place that was insufficiently protected. The result was that the herd had twice been scattered during storms, but both times the reindeer had been found and brought together again. It was my object to find a good sheltered place for Charley's herd before the time came for the dropping of the fawns. After wandering about for two days, I found such a place about 20 miles farther east. We then moved the herd and the camp to this place, and one of our apprentices was taken with us from the station and placed in the camp, together with the other people. Having attended to this matter, I continued my journey eastward along the coast to Golovin Bay, partly to get acquainted with the nature of the country and find out where there were good pastures, and the condition of the snow, and to see whether the herds which were in the future to be sent to Golovin Bay and to Yukon might be driven that way, and partly for the purpose of bringing from Golovin Bay some additions to our winter supply. From Antisarlook's herd, I continued with five reindeer and three sleds. I went only a short distance each day, as the weather was stormy and much snow was drifting. Besides the reindeer were not trained, it being the first time that they were in harness. As is usually the case with untrained animals, many turns were made along the road here and there, but this gave us all a better opportunity to find out the things that we were looking for with regard to the pastures, etc.

On the 20th of March we arrived at Golovin Bay and were well received by Mr. John A. Dexter and his wife. Their kindness, together with that of Mr. and Mrs. Hultberg, the last named the teacher at the mission school there, made our stay at this place a genuine rest. We had our daily bustle with boxes, barrels, bags, fish, and unmanageable reindeer, so we had a refreshing vacation. On the 31st of March we returned to the station, after having once more visited Antisarlook's herd.

In reference to the reindeer question we learned on this journey that three places between Port Clarence and Golovin Bay are suited for wintering with reindeer. Of these Charley will have one; the second is west of Sitah, and the third near Chamo. These three winter quarters are sufficient for this distance, as there will not be pasture for more than three herds. On the other hand, there is summer pasture for thousands of reindeer. Furthermore, we found that the herds, which in the future are to be driven southward, should not be driven around along the coast, but directly across the land to Golovin Bay, as the country is not well suited for a rapid journey with a herd.

On my return home a Lapp family, to wit, Aslak L. Somby, were equipped and sent to take charge of Antisarlook's herd while the fawns were dropped. The Lapp family returned to this station on the 20th of

May, the calving time being over, and reported that eighty fawns had been born, of which only one died, it having fallen over a precipice.

There is one of the herders, Tatpan, who has been at this station one year, and who doubtless does his duty as best he can, but the other watch is said to be very poor, and, as a consequence of this, we have to send three reindeer belonging to Antisarlook's herd to pasture a few miles from our station. These three animals have been looked after a couple of times a week until our herd gets to where it can be incorporated with it. On account of the ice we are unable at present to get any information from Antisarlook; but as soon as boats can ply I shall get information in regard to the facts. In case anything should go wrong a Lapp will at once be dispatched to take charge.

From the following copy from the sick list you will be able to judge of the condition of the members at the station:

Name.	Sickness or its cause.	Reported sick.	Reported well.
Wack rock	Fever	Oct. 30, 1894	Nov. 20, 1894
Tatpan	Cold	...do	Nov. 3, 1894
Le keog look	Cut his foot	Nov. 7, 1894	Jan. 5, 1895
Nasok (woman)	Lung disease; cough	Nov. 19, 1894	Still sick.
Frederik Larsen	Frozen feet	Feb. 12, 1895	Mar. 25, 1895
Martin Larsen	Cut thigh with knife	Apr. 3, 1895	May 14, 1895
Frederik Larsen	Boil	Apr. 5, 1895	Apr. 23, 1895
Do	Blinded by sun and snow	May 3, 1895	May 12, 1895
Ta oo teek	Fever	June 10, 1895	June 23, 1895

From this list it will appear that since the 30th of October someone has been sick all the time or unfitted for work on account of some illness. It appears, however, that there has not been much sickness when we take into consideration the total number of people. I have myself been well all the time, and I have not had a single day's indisposition.

There has been one death and two births at the station. One Eskimo child and one Lapp child were born. The Eskimo child is living, while the child of the Lapp died soon after it was born and was buried in a cemetery dedicated by Rev. T. L. Brevig. In this cemetery a white man had previously been buried.

This, perhaps, is the proper place to mention that all the medicines at the station are in the charge of Rev. T. L. Brevig, the only person who possesses any knowledge of such things. In the course of the year medicines have been given to those who needed them, with indifferent results, and we are now out of the most necessary medicines. On this point you will doubtless be informed by Rev. Brevig's report in connection with his requisition for next year. The want of skilled medical help has been severely felt.

The school has been entirely in charge of Rev. T. L. Brevig, and he will make the necessary report. The library of the station has also been committed to his care, and he will inform you in regard to the books now here and also in regard to new books that may be needed.

The buildings found at the station on our arrival have changed

appearances, having been built higher and some additions have also been made. A room was constructed last fall back of the main building for a storehouse. In this all bartering with the Eskimos and the distribution of supplies take place. We have also added a private room for the superintendent and another for Rev. Brevig, and also a kitchen. The east end of the main building was arranged as a dwelling for the minister and his family. The middle part of the building has been used as a schoolroom and the east end is used by the superintendent, as was the case with my predecessor.

The snow drifted around about the house aided materially in shutting in the heat, as the house was literally buried in snow up to the rafters, so that tunnels thirty feet long had to be made, through which we went in and out. We made similar tunnels ten to fifteen feet long to each window by the aid of barrels, out of which we took the bottom and top. These barrels were placed in the upper end of these light tunnels, and through these holes, fifteen to twenty feet long, we obtained a small amount of light. Seen from a distance, the barrels look like large Krupp cannon sticking out of the snow banks, and civilized people would doubtless have taken the station for a fortification of snow supplied with very heavy cannon. Thus, in a sense, we lived under ground, a mode of life which seems to be preferred even by white men after they have spent a few years in Alaska. Wherever you go, you find men talking about building their houses under ground; that is to say, they bury themselves alive.

In the course of the year we have put up the following new buildings:

1. A house for the herders and apprentices built of lumber and thatched with straw. It is 24 feet long, 16 feet wide, and 10 feet high, has five windows and two doors. Has a wooden partition which divides the building into two rooms, one used by the Lapps, the other by the Eskimos. Then there is a loft where a part of the people sleep. This is the third house of this kind at the station.

2. A temporary carpenter shop built of lumber, thatched with walrus skins. It is 16 feet long, 14 feet wide, and 6 feet high. It has two windows and a door. In this building most of the sleds have been made. Here the boats have been built, and here also the hides and skins have been tanned.

3. A schoolhouse 33 feet long, 22 feet wide, and 10 feet high. It has six windows and a door; built of lumber, but has not as yet been thatched for want of walrus skins.

Then a blacksmith shop has been fitted up in the subterranean dwelling built by Miner W. Bruce.

This is all that we have been able to do and it is our intention to have new buildings fitted up until the lumber drifting in here has been exhausted, and the following is our future plan of building: (1) A large convenient house for the apprentices; (2) some important changes in the main buildings; (3) a larger workshop; (4) a larger storehouse;

(5) a smokehouse for smoking meat and fish; (6) a bathhouse according to the northern Russian pattern; (7) a cold storehouse underground for the preservation of game caught in the summer, and for seal meat and seal oil; (8) quarters for Eskimos that come here, so that they do not have to lodge with our apprentices, as they have had to do the past year. It is impossible to keep them out without constant watching; (9) a house for boats and implements, where such things can be kept during the winter. The boats particularly are very much damaged by standing out in the snow all winter long.

How soon the houses here mentioned will be finished I am unable to say, but we will keep on working at them until the cold weather sets in, unless we should receive instructions to the contrary from you.

The furniture belonging to the station consists of some stools, which are in the same splendid condition as when I assumed charge. The tools and other implements are in fine condition, thanks to our blacksmith and the blacksmith shop. Of the rifles and other weapons sent, one shotgun is unfit for use, and it was so utterly dilapidated on my arrival that it can not be put in order outside of a gunsmith shop, consequently I will send it to the United States next fall. You doubtless perceived last fall when you were here there was only one rifle in a condition fit to be used. My father at once began repairing, and in the course of the winter he has put all the weapons and hundreds of other implements in good order.

I seize this opportunity of mentioning some little things and events which have occurred at the station and in its vicinity. Some of these things will be mentioned in the log book, but I think it worth while to repeat them here.

The four Eskimo police appointed at this station last year I discharged upon my arrival and no new police have since been appointed. When I first heard of this system of police, I formed a favorable impression of it, but after thinking the matter over more carefully my mind was changed and the result was that I discharged the police. We need no police for our personal protection. How far the station and school ought to have a police officer is a question which I will not at this time discuss, but under all the circumstances such a police should consist of civilized men who are supposed to have some idea of right and wrong, and not barbarians utterly without any idea of these things. Furthermore, one policeman instead of four would be sufficient. One of the four policemen who last year received pay from the station shot his neighbor last winter because he had stolen five reindeer skins from him. This murder occurred only a few yards from the station. The four policemen had a compensation of 20 sacks of flour for the year. The value of these I made use of in distributing things as Christmas presents among our Eskimo neighbors. I made up packages containing a few pounds of flour, a few pounds of beans, and bread for each family in the neighborhood, and on Christmas Eve I sent for a man from each family to come and get the bundles. They went home with happy faces

VILLAGE OF EAST CAPE, SIBERIA. (BERING STRAITS.)
Photograph by J. M. Justice.

and full of gratitude. We thought best not to play Santa Claus and carry the presents to the houses with the reindeer. From the account you will see that no more was used for these Christmas presents than heretofore has been paid to the police, and I think the station was more benefited by the results of this distribution, since we gained the good will, not of four policemen, but of the whole community.

Mrs. T. L. Brevig and Mrs. Kjellmann made, under the circumstances, a very nice Christmas tree, which was visited both by the children and grown people. Some presents were given to the children, while all received bread and butter and some taffy.

Through you I take the liberty of requesting the friends of missions who send presents to Alaska to send useful things, as, for instance, small tools, of which these people are very poorly supplied. A box of toy tools will do more good, make the Eskimos more happy, and contribute more to civilizing them than one thousand picture cards, no matter how beautiful or costly they may be. A few tools for soldering and some tin and acid would be very useful, as the people here use tin cooking utensils almost exclusively.

We have had no traffic at all in liquor. The Eskimos are too poor in this vicinity to buy ready-made whisky, and if they now and then have a little sirup and sugar these things taste too nice in the mouth of the Eskimo to be changed into liquor.

Of other illegal traffic, there has been some, partly in the immediate vicinity of the station, but it has mostly been confined to primers. Traveling agents have sold a considerable quantity of these and have thereby given great pleasure to the Eskimos in the neighboring villages.

We have made quite a number of skees in the course of the winter, and after a little practice the Eskimos seemed to prefer these to their snowshoes, but it takes a little time to learn how to use the skees, which will be found exceedingly useful in these regions. The apprentices had many a fall, but many of them have made sufficient progress to be able to make good use of them. The introduction of skees among the Eskimos must be regarded as a very important step for their advancement. We had abundant evidence of this, and only a few days after the first pair of skees had been finished a large number of boys came from the neighboring villages to practice on skees made by themselves in imitation of ours.

By adopting our skees the boots of the Laps also had to be adopted—that is to say, there had to be a hook put on at the toe to keep the foot in the skees. Our apprentices used the Lap boots the whole winter, and the Eskimos became very much attached to the square Lap caps. The Eskimos have also begun imitating the Laps in greasing the leather instead of using the skins as taken from the animals. Tanning of the leather and skins, and the Lap fishing tackle, have also been adopted, and thus the Eskimos have made considerable progress.

I shall now present a few observations and recommendations. There will be a great many of them, but I will state them briefly.

In the first place, I have to discuss the situation of this station. I have already heretofore said that my first impressions were not favorable, and it has since become evident on many occasions that a better place might have been chosen not far from here. When I say better, I mean better for the herd and for the reindeer industry. In other respects a more favorable spot could hardly have been found.[1] That which most prevents the prosperity of the animals is the dampness of the ground everywhere. Moreover, the landscape is monotonous—flat, without hills and deep valleys, where the snow lies until late in the summer, the best kind of medicine for a herd of reindeer. The greatest danger of losing reindeer is the ceaseless wind from the north during the whole winter and from the south and southwest during the whole summer. The latter winds are, however, not of great importance, but the biting cold wind in the winter keeps the animals from eating. They gather together as closely as possible to keep themselves warm. The animals exposed to the wind and cold continually run to the other side, and in this manner they continue until the storm becomes too violent and blows through the whole herd and scatters them.

As soon as the herd is scattered all the heads are turned with the wind and away they run until the storm is over. The storm may continue for weeks at a time. The reindeer continue to run until they find some sheltered place, where they begin to eat without thinking of returning. If so much money had not already been spent in building up the houses here, the station ought to be moved, even if no farther than to the south side of Grantley Harbor or on the same side of Lake Imaurook, where the ground, the pastures, and the climate are excellent.

In selecting apprentices it would not be well to choose the best huntsman among the Eskimos, for the fact that a man is a successful huntsman shows that his strongest interests lie in the direction of a hunter's life; that this view is correct has been demonstrated by our apprentices. The liking for hunting is a hindrance to the interest in herding and taking care of reindeer, and hunters are not willing to settle down to the somewhat confining life of a herder. To this should be added that all those among the Eskimos who live where there is seal fishing, and who on that account are good, zealous huntsmen, are the ones who in the longest run will be able to maintain themselves without reindeer. They will longest be able to get their support from the seal. Such apprentices should first be chosen who are likely to be the first to need help in obtaining their support, to wit, those Eskimos who live among the fiords and along the streams. These have nothing to satisfy their hunger with but fish which they catch from day to day. The best and most intelligent men among these should be chosen and be given the first places regardless of how poor they may be. The chief thing to be considered is their intelligence.

[1] The site was selected because of its advantages for landing supplies for the herd and the station. Seagoing vessels can not safely enter Grantley Harbor.

These people are more accustomed to life in the interior of the country. They take an interest in fishing, which does not hinder, but, on the contrary, adds to, their usefulness as herders, since fishing as it is here conducted can well be united with herding, and both things can be looked after at the same time, while seal catching and herding can not be done simultaneously, the territory of each being so far apart. In the next place, I think it would be better to take the apprentices directly from the Eskimo people and not from any of the mission stations. The habits they have acquired at such stations and the many toils of a herder's life are widely separated. How far it is advisable to keep apprentices of the Eskimos and Indians together it is not easy to determine, but it does not seem to me to be advisable. These two races are so different in language and customs that they do not seem to thrive together. I do not mean to say that the Indian should not have an opportunity to learn the art of herding reindeer, but I should think the matter might be so arranged that those two races could be apprenticed in different places. I have simply mentioned this so that you may take it into consideration.

So much has been said and written about the impending and present want of food among the Eskimos that I need not repeat it here. I have neither the ability nor a sufficient knowledge of the facts, outside of a very limited territory, to be able to present anything new or of importance in this direction. I may, however, mention a way in which the present want might be temporarily supplied without great cost on the part of the Government. It appears that the fishermen are the first to need help, since they neither possess nor are able to purchase suitable tackle. Their implements are at least five hundred years behind the times. They are made from strips of seal skin (seal thong). This material grows annually more expensive and difficult to get, since the seal fishing decreases and the use of the skins increases. The demand for seal skins is greatly increased on account of the large number of white people who annually come to this country. The Eskimos of the interior—that is, those Eskimos who live by fishing—are not able to kill any of the seals themselves, as they live too far away from the fishing ground. They have to buy both the skins, thong, and oil, as they need seal oil for light and food. All these things, which are so necessary for their support, must be paid for with fish, as they have no furs to barter with, and as the price of the seal is continually rising, it takes a large part of their fish supply to pay for these things.

There is still an abundance of fish, if the Eskimos only had better fishing tackle and more knowledge in the use of it. I therefore take the liberty to recommend to the Government to furnish a supply of twine for fishing tackle—No. 2 soft laid—and to distribute it among the population here. The expense would not be large, since about 500 pounds of thread would supply a very large number of people. Instruction in making and in the use of modern fishing tackle and the distribution of

thread among the people would certainly be assumed by every missionary in the locality where the Eskimos are found in considerable numbers. In this way about $150 a year would give temporary relief to the most pressing distress until the reindeer have become sufficiently numerous to furnish a livelihood to these poor people. It is to be expected that the reindeer will finally solve the problem and become the source of future wealth to all Alaska.

I would recommend that you appoint a capable physician at the station. A compliance with this recommendation is of the greatest importance. It is hardly proper to keep fifty persons together here without the least intelligent medical aid or the opportunity of getting to where such can be found in any direction. This matter has often been alluded to by the Lapps when they have been sick. My dear Dr. Jackson, please do what you can to have a physician located here, in order that not only those living here and at the neighboring stations, but also the whole Eskimo population, may not have to resort to the heathen medicine men—that is to say, to the miserable witches among the Eskimos. These medicine men ought to be punished for their practice and for the bondage in which they keep the whole population. Death is frequently the result of their meddling, and they bleed their victims in all directions, so that it is difficult to state which is to be preferred—to die, or to get well and be compelled to feed and maintain one more person in future; that is, the one who saved the life, according to their views. These medicine men never work, but they live in luxury on their victims and among the relatives of their victims. There are a great number of this kind of medicine men, occupying various degrees in their art, and they constitute no small burden in the community in which they live, and they are of no use whatever.

To quote one example out of many hundred, I may relate that during my journey to Golovin Bay last winter I spent the night in an Eskimo hut where the woman in the house was paralyzed from the hips down. By asking questions and by conversation, it appeared that the family had no boat, and as a reason for this it was stated that the medicine man had forbidden any of the members of the family to own a boat. If a boat should come into the possession of the family the woman would die, for then the medicine man would lose his power over the evil spirit which had taken its abode in the woman's feet, and this spirit would then spread itself over her whole body, and she would die. Fully believing this statement by the medicine man, the family had not had a boat for years of any kind whatever. This was a great disadvantage, as the family were obliged to support themselves by fishing from the bank, and this was very little, since in order to catch this small amount of fish the family had to move far away from their people and live in a place that was very exposed and barren. It was, however, so situated that they were able to get some means of a livelihood. In spite of all

this, the family felt grateful to the great medicine man among them because he was able to keep the evil spirit from spreading itself and killing the woman. In this case only one family was kept in bondage, but it often happens that a whole neighborhood suffers, since these medicine men predict all kinds of misfortunes if anyone in the village does this thing or that, no matter how necessary it may be to the support of life.

By bringing civilized physicians to accessible places, this annoyance would soon be put down and in the near future it would disappear, but to rob these ignorant people of something without giving them something else in place of it would doubtless be improper. In addition to all this it should also be remembered that Port Clarence is the only suitable harbor in this region. It is a central and favorable trysting place for the fleet of the whalers who might also get some help from a physician located here.

In regard to the manners and customs of the Eskimos, I have nothing to report at this time, partly on account of my short sojourn here and on account of my ignorance of the language. I have had no opportunity of studying the character of the people sufficiently to get any intelligent description of them. All I can say is, that they are experts in small thefts and in begging, and I suppose that their poverty is the extenuating circumstance.

The law against the importation of rifles and fixed ammunition does not seem to be of much use in this part of Alaska, as it is only a dead letter.

In your instructions I have seen nothing stated in regard to fuel and therefore we had to procure this as best we could. Driftwood was hauled to the station for fuel, and for this purpose only is it serviceable, but if we do not get a considerable supply of driftwood this summer and every summer—a fact which I doubt—we will be placed face to face with the reality of being utterly destitute of this absolutely necessary article in this latitude. The driftwood we found was plainly the result of the drifting of many summers. It would surely be no pleasant surprise in this region to be found without fuel, where the wind and the cold come with an unconditional demand to be respected. It has already become necessary to get the fuel from places 10 to 12 miles distant. All that could be found near at hand has gone up in smoke, and the supplies to be found even within a range of a dozen miles is hardly sufficient for another year, and when it is gone the further supply will have to be brought from the other side of Point Spencer, where doubtless some fuel can be found, but the distance will be so great that it will require two days for each journey, and this transportation can be carried on only while the ice is perfectly safe; that is to say, during the severest part of the winter. We must also bear in mind that fodder for the reindeer must be carried on these journeys, as there are no pastures on bare and weather-beaten Point Spencer.

When we take into consideration that the Eskimos are gradually

using more and more driftwood, stoves taking the place of seal-oil lamps, the prospects for the future are not bright. I have considered the matter very carefully and the result of my contemplations I will present in a recommendation that coal be imported, at least enough for the use of the school. In that case the supply of driftwood still to be found in this side of the bay will last much longer. Herders and apprentices will possibly be able to find what they need and the private people living at the station will have to be left to themselves to get fuel as best they can.

Either coal should be imported or a naphtha or electric boat procured whereby fuel can be towed in rafts during the summer from the southwest side of Point Spencer and other remote places where timber for building purposes might also be brought to the station instead of importing materials from the States. Such a boat would also be useful in a hundred ways in connection with fishing, in connection with and transporting of provisions to the camp, and in making visits to the herd, etc.

Which one of these recommendations will be cheapest in the long run I will leave to you to determine; but I will add that a naphtha or electric boat would, in addition to bringing fuel, be of three times as much use during the year as the same amount of money spent for coal. There are several persons here who have the necessary skill and knowledge to handle and take care of such a boat.

As no real assistant has been appointed at the station during the past year, there are doubtless many things which should have been done that have been left undone. One man can only do one thing at a time. I have the satisfaction of having done the best I have been able, and all the necessary things have been done in the right time; and it may be said in general that matters have received as good a supervision as I have been able to give them. The question concerning an assistant will be discussed and determined when a man arrives here this year to inspect the station and transact the necessary business.

Any defect in the report must not be ascribed to any negligence on my part, but solely to my want of the proper education necessary to present my ideas suitably in writing in the English language, my education having been in Norwegian. Finally, I wish you every blessing and happiness, and I hope you may be eminently successful in your effort to help and elevate these people who lie buried in heathendom. I also wish to express my hearty thanks to those who have assisted and who are still assisting you in this great work.

I remain, dear sir, your obedient servant,

WILLIAM A. KJELLMANN.

Dr. SHELDON JACKSON,
Bureau of Education, Washington, D. C.

APPENDIX C.

REINDEER REPORT, CAPE PRINCE OF WALES.

By W. T. LOPP.

CAPE PRINCE OF WALES, ALASKA, *June 6, 1895.*

DEAR SIR: In accordance with the conditions expressed in your letter of July 27, 1894, giving to this mission a herd of domestic reindeer, I hereby submit our annual report.

We have experienced no serious difficulties in their management, and with the recent increase of fawns the herd now numbers 174.

Our herders have consisted of five Eskimo boys, ranging in ages from 14 to 19, and one Siberian, all of whom were with us last year at the Teller Reindeer Station at Port Clarence. Until April they lived in a log house about 7 miles northeast of the cape, and since then they have lived in a tent. The winter has been unusually severe, and on some occasions when blizzards were raging the herd or parts of it have been lost. But when the weather cleared up they have always been able to find the deer. Regular watches were kept by our herders until January, when some of the Eskimo herders from the Teller Reindeer Station explained to our boys how they and the Laplanders stood no regular watches and did not herd the deer at night. From that date to the time of calving, our herders stood no night watches, much to their own satisfaction and comfort, and no loss to the herd. It is our opinion, however, that a night watch should be kept over a herd, unless the ground is covered with snow and there is no danger from dogs and wolves.

Our six sled deer have been kept busy packing and hauling supplies and wood. New deer have been broken, but most of them are too young to be very useful before one or two years. In March, Moses, the Yukon Indian boy, came up from the Teller Reindeer Station to visit our boys, and while here broke a 4-year-old steer according to the Laplander method. The Lapp harness has many advantages over the Siberian harness, but it has the same objectionable feature of a single trace rubbing through the hair and skin of the hind legs. Both, however, are admirable for breaking deer to the sled. A slight modification of the harness used on horses seems to be best adapted for use on the treeless plains in this section. We have used Eskimo and Siberian sleds only, as the snow is hard here most of the winter.

We have lost 9 deer during the year, 3 females and 6 males. One (a bull) was killed in fighting, 2 ran away, 5 (3 of which were sled deer) were killed by dogs, and 1, which our collie dogs ran away, a coast native shot. At first the deer became frightened at the collie dogs, but they have now become accustomed to them. In the case referred to, our dogs followed one about 30 miles up the coast and ran it down between the coast and large inlet lake, which is about 8 miles wide. Thin ice on the lake made it impossible for the deer to return by swimming. The dogs deserting it, a simple-minded native found it a few hours later, shot it, and sent us word.

As only four 2-year-old bulls were allotted to our herd when we left the Teller Reindeer Station, and one of these becoming crippled and another killed by fighting, we were afraid many of our cows would have no calves. But we have been very agreeably surprised. We now have 69 fawns, having lost only 6 by cold and accident. During the calving season in April and May we kept the herd in a sheltered place at the mouth of Sooh-ung-wok River, about 25 miles from here.

Last August and September we kept a cow tethered near our house and milked her daily for our own use.

Very respectfully, W. T. LOPP.

Dr. SHELDON JACKSON,
United States General Agent of Education in Alaska.

P. S.—Since the date of the above report we have lost 2 cows and 1 fawn, which leaves 171 deer in our herd. One of the cows died from internal injuries received in calving, and the other was probably crippled by our Siberian, so that it had to be killed. The fawn died from intestinal troubles.

W. T. Lopp, Superintendent of Teller Reindeer Station, 1893-94

APPENDIX D.

LETTERS OF J. C. WIDSTEAD TO DR. SHELDON JACKSON.

TELLER REINDEER STATION,
August 28, 1895.

SIR: Mr. Hamilton has by this time made you familiar with the change that has taken place at our station.

The schoolhouse is completed, or nearly so, and I think you would, could you see it, find it very cozy. We intended to put in six windows, but as we had not so many, and none came with the supplies this year, only four had to do.

We have also, with the lumber that came, put up an addition to the station 48 by 17 feet westward and 40 by 24 feet northward, with room for an assistant, one separate room for natives trading, three rooms for herders with family, and one 16 by 16 feet for the boys; besides, we have in the same building boxes for fish, seal meat, and seal oil, with a hallway leading all through the building to keep outsiders out. Upstairs we intend to partition off separate rooms for fur and clothing if lumber holds out.

We have thought it best to have all the boys in one room, and get an old woman to cook for them. By this we can save, I think, some on the provisions, and control them much better than formerly, when any one in the house could sit down and eat with them, as is their custom; she could also wash and scrub for them.

Back of the Eskimo's room will be the store, with one little partition door to the herder's house, and one to the Eskimo's room for trading. This will keep the two separate, besides save time and much trouble. As it now is in the old store, traders outside the counter can lean over and take anything on the shelves when not watched.

The Lapps are all very well and pleased, except Mathis Eira, who has been a constant worry to Mr. Kjellmann and myself since his coming here. He is dirty, insulting, lazy, absolutely refuses to do my bidding, scolds me in the presence of the boys and other Lapps, and hangs around the station for days at a time. Then he seems to take a spell and does his duty again. But lazy he is, and will be. Now, what can be done with him? He is the most expensive herder at the station, and does the least. I mention these things that they can be acted upon during the winter. The other Lapps are very good fellows—as trustworthy and true as Socrates in respect to duty.

point that you remember we refused to allow any women to go to those stations, and the men were informed that they took their lives in their hands in volunteering to go; and yet we established three schools, placing one man at Point Barrow, one at Point Hope, and two men at Cape Prince of Wales, where they were unmolested. The killing of Mr. Thornton, at Cape Prince of Wales three years afterwards (as was proved by the fact that the murderers were at once shot by the natives themselves), was not the act of the people, but of a couple of hoodlums. The same thing might have occurred in any of our large cities.

Last winter three whalers spent the winter with $1,000 worth of barter goods on St. Lawrence Island, and this year we have placed a man and wife alone on that island with $500 or $600 worth of provisions. At Cape Prince of Wales two years ago Mr. Lopp was there entirely alone with a large supply of provisions.

The whole history of the coast has proved the safety of white men located there who behave themselves.

The second objection is to the effect that the Siberian reindeer men will become jealous of the transporting of so many deer to the American side, thinking that it will deprive them of the monopoly of the trade in skins that they have had in the past. This, too, is very plausible, but not substantiated by facts. The same objection was persistently urged against the possibility of purchasing any reindeer, and yet we have been able to purchase some every season, and have already secured on the American side a number that in a term of years will make the Alaska people independent of the Siberian trade. If the Siberian natives are shrewd enough to object to large numbers of reindeer being taken to Alaska for fear of losing their trade, they should have refused to sell from the beginning.

It may be inexpedient, because of the disinclination of certain parties upon whom, to a certain extent, we are depending for assistance, to establish a trading post on the Siberian side at present; but whenever it becomes urgently necessary to secure the reindeer in larger numbers and hasten the work it will be found necessary to adopt that measure, or at least to give it a trial, as other efforts have so far failed.

Very respectfully,

SHELDON JACKSON.

Hon. W. T. HARRIS, LL. D.,
Commissioner of Education.

APPENDIX F.

DAYBOOK AND JOURNAL AT TELLER REINDEER STATION PORT CLARENCE, ALASKA.

[Kept by W. T. Lopp from July 1 to August 10, 1894, and by Rev. T. L. Brevig from August 10, 1894, to June 30, 1895.]

July 1, 1894.—Southwest wind. Captains Porter, Hagerty, and Robinson came over from the anchorage in a whaleboat to see the herd. Rev. Edson conducted divine service in our schoolroom.

July 2, 1894.—North wind. Mr. Willocks, of Pittsburg, Pa., visited the station. Captains Mason, Williams, and Townsend, of the whaling fleet, repair the lighter launch and anchor it.

July 3, 1894.—South wind. The United States revenue-cutter *Bear* arrived at the anchorage about 5 a. m. and steamed over to the station. Forty-eight deer were landed; also a quantity of cedar lumber and spruce posts; Captain Healy's steam launch towed them ashore on the Pacific Steamship Whaling Company's launch. Dr. Jackson remained on shore over night.

July 4, 1894.—The *Bear* dressed ship and saluted in honor of the day. Dr. Jackson took inventory of stock on hand at the station. At 8 p. m. the *Bear* weighed anchor and steamed for the watering place on the south side of the bay.

July 5, 1894.—South wind. Let Charlie and Mary go to Point Spencer to see their brother. Our gill nets catch plenty of nice salmon. Begin to pack up preparatory to leaving for Cape Prince of Wales.

July 6, 1894.—The *Bear* leaves the watering place and steams over to the anchorage. Charlie and Mary returned from Point Spencer; they report walrus very plentiful.

July 7, 1894.—South wind. Good catch of salmon.

July 8, 1894.—South wind. A whaleboat from the fleet sails to Nook. The usual Sunday service.

July 9, 1894.—South wind. Heavy surf and rain. One fawn born. Start with the Siberians for the anchorage; about one-third the distance we met the *Bear's* steam launch with Dr Jackson and Captains Weeks and Sherman on board; Lieutenant Dodge in command. We were towed into the station again, where a settlement was made with the Siberians; it was decided to pay Dantin and Nootadlgot $75 worth of goods, as had been promised them, but Anker was allowed wages for only seven months, from which was deducted the rations he had received

since his discharge in February, being dissatisfied a little more was added. Captain Weeks was in search of two deserters that had left on July 4; at his request we sent two of our native police to Nook to hunt for them and put them in irons and return them to the ship. Discharged Sungoo, who has been here in the capacity of a worker and handy man. We returned to the fleet in tow of the launch.

July 10, 1894.—The *Bear* left the anchorage about 1 p. m. for South Head to land Dantin and Anker. The schooner *Rosario* anchored here to fish and then went to Nook. We returned from the fleet in one hour and fifteen minutes. The deserters could not be found at Nook.

July 11, 1894.—South wind and rain. The steam whalers leave the anchorage; the *Rosario* goes out. Mr. Grubin and some of the herders, with the *Bear's* seine net, lent by Captain Healy, went to Nook to try their luck with salmon. A male deer dies from internal injuries.

July 12, 1894.—Calm; rain. I hear from some Noometes that the deserters are there, and I send two of the police after them. While they are gone the two men arrive in another canoe. We gave them dinner and supper in Charlie's house, and when the police returned we persuaded the men to go to the steamer *Jeanie* and give themselves up. Try the seine here and catch nothing.

July 13, 1894.—North wind and rain. The whaleboat returns from Nook with about 900 salmon. The *Jeanie* and *Peters* went out. Make flume for closet.

July 14, 1894.—North wind. Charlie cuts a window in east end of herders' house. Two canoes return from Point Spencer. Our police received 5 bags of flour for taking the deserters over. Send the seine again to Nook to try for salmon and catch 6.

July 15, 1894.—South wind and rain. Sunday services as usual.

July 16, 1894.—South wind and rain. Canoes come from Point Spencer. Send whaleboat to Grantley Harbor to fish.

July 17, 1894.—Southwest wind with rain. Milk a quart of milk from 5 deer.[1]

July 18, 1894.—South wind, with rain. Milk another quart of milk.

July 19, 1894.—Southeast wind, with rain. Whaleboat returns with about 300 pounds of salmon trout. Send the scow up the lagoon for wood.

July 20, 1894.—South wind, with rain. The little creeks become rivers; surf is very high; herders thoroughly drenched.

July 21, 1894.—South wind, with rain. Mr. Lopp was sick.

July 22, 1894.—South wind, with rain. Small Sunday school conducted by Mrs. Lopp. Moses is sick.

July 23, 1894.—South wind, with rain. Let Charlie's brother and two of our herders go to Nook with our seine, to try for salmon.

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[1]By the Siberian method the deer are thrown down to milk. They are frightened and withhold it. With the advent of the Lapps, modern methods were adopted.—EDITOR.

July 24, 1894.—South wind with rain. The *Bear* arrives from Cape Serdze, Siberia, with 38 deer—11 males and 27 females.

July 25, 1894.—South wind and heavy surf. Two deer ran away when turned loose after landing; the boat capsized in the surf. The last load was landed at the mouth of the lagoon to escape the surf. Our whaleboat lands 60 bags of flour, 5 boxes bread, beans, and molasses. Mrs. Healy and Mr. Liebes come ashore. Kill a female deer that had a leg broken in landing.

July 26, 1894.—Northwest wind. On invitation from Dr. Jackson, I accompanied him up the lakes in the *Bear's* steam launch, which Captain Healy placed at our disposal; we returned about 5.30, and after taking dinner with Captain Healy, came ashore. A male and female deer which were crippled on ship or in landing, had to be killed. Mr. Grubin and the herders milked two quarts of milk from six deer, two bottles of which were sent to Captain Healy and officers on the *Bear*.

July 27, 1894.—South wind. Went aboard the *Bear* in the forenoon; she weighs anchor and leaves for the Arctic.

July 28, 1894.—Northwest wind. We go in small boat up the lagoon to a river and give our babes an outing.

July 29, 1894.—South wind. The 2 deer which ran off a few days ago returned. While holding our Sunday service a ship was announced as anchoring at Point Spencer.

July 30, 1894.—South wind. The brig *Meyer* came over from Point Spencer in the afternoon and anchored off shore. Mr. Wm. A. Kjellmann, the new superintendent, wife and daughter, Rev. T. L. Brevig and wife, and Mr. and Mrs. V. C. Gamble, who are to teach at St. Lawrence Island, came on shore in the evening and inspected the station and herd.

July 31, 1894.—The *Meyer* beat up closer to shore and employed natives to help discharge the vessel. The Lapps and their baggage were sent on shore. An Eskimo remarked when he first saw the Lapps: "Well, well! these are the people we have seen on our playing cards for all these years." We saw the Lapps milk deer; after lassoing, they make a halter-like noose with which one holds the deer while another milks.

August 1, 1894.—Calm, with south wind. Mr. and Mrs. Lopp move into the herders' house and the Kjellmanns into the west end. The Brevigs move into the east end of the frame house. The work of discharging the vessel progresses very slowly. During the night the station dogs broke into the dugout and killed the old goat of the Kjellmanns, and during the day they killed one of the kids.

August 2, 1894.—Calm, with rain. The Cape Prince of Wales supplies were landed and put under the canoes.

August 3, 1894.—Calm, but rainy. Two Lapps go back into the hills to get acquainted with the locality. The flour and bread is landed from the vessel.

August 4, 1894.—South wind. Nothing landed in the morning. The dugout is repaired; the Lapps move it. One Lapp returns late in the evening and reports his companion sick and left about 7 miles from the station. Mr. Kjellmann, with two Lapps and six Eskimos, started out to find him; they missed him, but the other Lapps had also gone out, finding him a little northwest from where the others crossed the hills.

August 5, 1894.—Clear and calm. Lumber landed. Norwegian service for the Lapps and service for the Eskimos in the afternoon. Mr. and Mrs. Gamble remained at the station over night.

August 6, 1894.—Northeast wind. The *Meyer* had discharged her cargo for Port Clarence and Cape Prince of Wales, and commenced to take in a supply of water before leaving. The Gambles remained at the station all day and night. The Lapps drove the deer into a pen to milk them, and obtain about 6 quarts of milk.

August 7, 1894.—South wind and clear. One Lapp and two Eskimos herding; the rest are employed binding nets and laying up wood for winter. Mr. Lopp is ready to go, but the heavy surf keeps him. The Gambles remain at the station.

August 8, 1894.—Calm, fine day. The whaler *Fearless* was sighted near land through the fog, and when the fog lifted she anchored near the *Meyer*. Brevig and Gamble boarded the *Fearless* and took dinner with Captain Simonson. In the afternoon Captain Holland and Captain Simonson of the *Fearless* came ashore and visited station and herd. The Gambles went on board the *Meyer* in the evening. The herd was driven into the pen and 83 female deer, 4 sled deer, 5 steers, and 8 bucks were selected and marked as the Cape Prince of Wales herd, the mark being a round hole in the right ear. Two deer were marked in a different manner for each of the herders.

August 9, 1894.—South wind. The *Meyer* and *Fearless* are still at anchor; the heavy surf still delays Lopp. The east end of the house is under repair. About 18 of the Cape Prince of Wales herd came back and were met with 8 from this herd, 4 miles east of the station. Our deer had their calves in the cape herd and could not be separated.

August 10, 1894.—South wind, with heavy surf. The *Meyer* and *Fearless* left for the Arctic at 4 p. m. The Gambles were landed here and will stay till the *Bear* comes and takes them to St. Lawrence Island. The Lapps, with Grubin and four herders, left at 6 p. m. The other herders left yesterday in a whaleboat. The Gambles occupy Mr. Grubin's bedroom, and Brevigs move into their bedroom, partitioned off from the sitting room. One deer runs away from our herd and joins the cape herd.

August 11, 1894.—Calm, clear, and a beautiful day. The east end of the herders' room was fixed up as a kitchen and storeroom for Brevig, and the west end as a private storeroom for Kjellmann. The herders not with the herd are making gill nets and tents. Traded some salmon.

August 12, 1894.—Calm, clear, fine day. Service in Norwegian for

Lapps and in English for Eskimos. At 8 p. m. a breeze set in from the west, with fog.

August 13, 1894.—Calm, clear, fine day. Early in the morning a steamer was sighted; she anchored close up to shore at 8 a. m. It was the *Albion* from San Francisco with Bruce and Gibson on board with their Port Clarence troupe of Eskimos as passengers. Captain Lundquist said they had landed a cargo at St. Michaels and from here they were going north to Kotzebue Sound to establish a trader's station. Bruce was speaking about getting another troupe with him down on the side-show line next winter. The *Albion* left at 2.30 p. m. We sent mail with Captain Lundquist.

August 14, 1894.—Calm and clear; easterly wind. Continued repairs of "lean-to." Four Lapps were sent out to build a corral for the deer. The twine gill nets catch sufficient salmon for the station's use.

August 15, 1894.—Calm and clear, with a light northerly breeze in the evening, +78° at 2 p. m. Gamble and Brevig took an outing to Grantley Harbor in a canoe. They returned at 7 p. m. with snipes. The Lapps finish the corral. Kjellmann and 4 Eskimos work on the lean-to to transform it into a store; 6 quarts of milk.

August 16, 1894.—Clear and calm; very warm; Brevig's birthday; north wind very strong. Our skin dingey drifted off to-day. Gamble and Charlie had forgotten to fasten it last night.

August 17, 1894.—The steamer *Albion* called in on her return from Kotzebue Sound and landed some women and took one or two others on board. She also watered; left at 11 a. m. Nobody called at the station; 4 quarts milk.

August 18, 1894.—West wind, clear. Four natives lay up wood for winter; 5 quarts milk. Cape Prince of Wales canoe go to Grantley Harbor.

August 19, 1894.—Sunday. Calm and clear, with the usual service and Sunday school. Three children were baptized, two Eskimos and one Laplander.

August 20, 1894.—Northwest wind. The *Bear* came in about 11 last night. Dr. Jackson and a lieutenant came on shore for the *Bear's* mail. Mr. Grubin and natives returned at the same time. Dr. Jackson was on shore all day settling Laplander business.

August 21, 1894.—Dr. Jackson on shore all day attending to business. Mr. and Mrs. Gamble were taken on board the *Bear* to-night, as Captain Healy consented to land them on St. Lawrence Island.

August 22, 1894.—Strong wind changing to west and abating during the day. Early in the morning W. T. Lopp's goods were taken on board to be landed at Cape Prince of Wales. The *Bear* sailed at 9.30 a. m. Captain Healy intimated that he might call again. Three Lapps and 5 Eskimos went to get logs for a house up the lagoon. Four Eskimos were sent to the herd and 5 will remain at the station. Six quarts of milk were brought in to-night. The first snow of the season appeared on the mountain tops and high hills.

August 23, 1894.—Southwest wind strong in the forenoon, abating toward night. Clear and fine. Mr. Grubin took two more men up to the lagoon wood party. Continued house fixing.

August 24, 1894.—Strong southwest wind; clear in the morning; cloudy the rest of the day; wind changing to south. The store or trade room is now ready and the partition in the old storeroom is taken down to be used as a schoolroom until the schoolhouse is ready. A fawn was killed that was in someway maimed so it could not walk.

August 25, 1894.—Cloudy, with occasional showers, the rain becoming general toward night. The wind veered from south to southeast, becoming strong and causing a high surf. The woodcutters returned late last night with only a little wood, stating that the water was too low to float logs of any size. Six quarts of milk. The village seems deserted; the people are out fishing or hunting.

August 26, 1894.—The clouds drizzled through roof and walls, exposing our supplies to a wetting. Wind northeast, sobering down toward evening, exposing a patch of clear sky. The usual services. The music and singing seem to please the people.

August 27, 1894.—Cloudy, with rain spurts. Wind light from south in forenoon, calm in afternoon. The superintendent with a gang of herders left for the lagoon to get logs and wood. Soon after, Thorwald Kjellmann left for the second lake to fish, taking with him Charlie and Mary Wocksock, Per, and Mikkey, who were to be landed near Nook and travel overland to explore the country in reference to winter feeding grounds. The two Point Hope boys and Moses were left to help around the station. Mr. Grubin and the teacher continued the repairs on the house.

August 28, 1894.—The same wet, foggy, drizzling weather; calm. Continued repairs around the house.

August 29, 1894.—Calm, with a light breeze from the north in the evening. Kjellmann returned with 60 logs, and has another raft started. Several natives went up the lakes to fish.

August 30, 1894.—Light north wind, with light clouds. The Lapps received provisions for a month. A Cape Prince of Wales canoe arrived with letters from Mr. Lopp, to be forwarded with the *Bear* if it anchored here again. The deer are milked daily, and some cheese is being made.

August 31, 1894.—Clear, calm; a beautiful day. The roof of the lean-to was fixed; a coat of tar put on warm, and cement was put on and seemed well adapted to keep the rain and flour from affiliating. Mr. Grubin brought another raft of logs from the lagoon. No report from the deer.

September 1, 1894.—Calm and cloudy, with light south wind; rain toward evening. The raft of logs was landed. A door was put in the west end of the building, Kjellmann's kitchen. The center room of the building was fixed up for a schoolroom. Only three tents remaining on the beach. No report from the deer.

HOBBLING REINDEER, SIBERIA, PREPARATORY TO SHIPPING TO ALASKA.

Photograph by William Hamilton.

September 2, 1894.—Light south wind, cloudy and foggy. The usual Sunday exercises. A seal was killed just outside the station by a Singamut. Some reindeer milk was brought in in the morning, and orders were given to discontinue the milking for a week.

September 3, 1894.—Calm and overcast. School commenced with 7 pupils during the day session, and 8 of the herders attended during the evening. The logs for the herders' house, west of the other houses, were put in place.

September 4, 1894.—A clear, very nice day; light north breeze. Mr. Grubin left about noon for the lagoon with a crew to get wood and logs. Work was commenced on the new house, 16 by 30. The fishing party returned from the lakes with considerable fish that they had caught and bartered for; also some birch wood for sled handles, etc. Per Rist had explored the country around and found plenty of grass and moss, and pronounced it good for winter pasturage.

September 5, 1894.—A bright, fine day, with two heavy showers in the evening. About 7 p. m. the smoke of a steamer was discovered in the cape region, and when last seen was nearing the sandpit. Public opinion agreed it was the *Bear*. A canoe arrived from the Diomedes in the evening. The day school was attended by 20 children. Continued work on the herders' house.

September 6, 1894.—The *Bear* was moored outside the station this morning, and Dr. Jackson came ashore at 7 a. m. to get Kjellmann and some Lapps to come on board and land the deer. Johan and Mikkel went on board and landed the deer by throwing them overboard and letting them swim on shore. Thirty-two deer were landed.

September 7, 1894.—Calm, cloudy, showers. The Mesdames Brevig and Kjellmann were invited on board the *Bear* for dinner. Dr. Jackson was on shore all day settling accounts with Kjellmann. No school, as the teacher's roof leaked so badly that he had to fix it. In the afternoon the officers of the *Bear* were on shore hunting, and most of them visited the station. The ladies returned home from the *Bear* at 10 p. m. and reported a "splendid time."

September 8, 1894.—A fine, warm day, with occasional showers in the afternoon. At 9.30 the steam launch took the station's ladies on board to join a pleasure party going up the lakes; they returned at 7 p. m., reporting a "good time." Dr. Jackson came on shore and had a talk with the herders before leaving. The first lieutenant of the *Bear* was on shore just before she sailed and took an inventory of all the ammunition, Government and private, at the station. The *Bear* sailed at 10 p. m.

September 9, 1894.—A fine, clear morning, with rising west wind and turning colder. The usual Sunday service.

September 10, 1894.—The wind increased in strength all night, and has been blowing a storm from southwest with rain all day.

September 11, 1894.—North to northeast wind, increasing in strength;

bright and cold; growing colder. A crew of Lapps and Eskimos was sent to gather moss for a winter supply. A Cape Prince of Wales canoe arrived from Kings Island with a letter from Mr. Grubin to Mr. Lopp.

September 12, 1894.—Light north wind; bright. The frame of the dingey blown away in August was brought back by some natives from the other side of the bay. The Lapps and Eskimos went out to gather grass for fillings in Lapp and natives' boots; returned with a good supply.

September 13, 1894.—A clear, fine day. A thin crust of ice had formed on the pools, and frost covered the ground. Kjellmann took two native herders with him for more grass. The moss party returned, reporting much mast put up. Kjellmann and another native brought in 14 deer that he had found, 7 or 8 miles north from the station, alone and unguarded. A canoe from the big Diomedes came in to trade.

September 14, 1894.—Mr. Kjellmann took the 14 deer back to the Eskimo herd in the morning and found they were not missed by the herders. The Eskimos were busy boiling deer meat, and Martin said he had killed a female deer that was sick, but no report had been made to the superintendent. Martin was ordered in to the station to explain matters or pay for the deer and leave. A canoe left for Cape Prince of Wales and letters were sent to Lopp. A clear, nice day; calm.

September 15, 1894.—Clear, bright, and calm. The dingey was fixed to be serviceable.

September 16, 1894.—Clear, bright. Martin was exonerated from killing the deer. Per Rist had killed her, as she was dying, six ribs having been broken. Frederick Larsen was appointed messenger. He is to leave for the herd about noon and return in the evening with report from the herd. Six deer were reported missing and Antesilook hunting for them. The usual Sunday exercises.

September 17, 1894.—Strong north wind, calm and clear. The dog sniffing was the cause of the discovery. A bull was reported dying from wounds received in fighting another bull, the horns passing through the vitals. Oowoodlet got permission to visit his mother and friends; 18 children attended the day school, and 12 the evening school.

September 18, 1894.—Clear and nice. Seven Eskimo herders were sent up the lagoon for logs and wood. The roof was laid on the herders' house. Brevig put on double windows and painted the sash and frames. The ever-curious Eskimos painted their artegas, noses, faces, etc., without the use of a brush by pressing them against the newly painted windows. Considerable fish was traded. No report from the deer.

September 19, 1894.—Overcast, with strong south wind; showers. One deer reported sick. Three deer were reported seen near the lake east from the station. Kjellmann went and found them; one was sick and was known to be there. The lumber crew returned, reporting a

raft ready, but impossible to move because of high winds and surf. The herders seem to enjoy their evening school.

September 20, 1894.—Strong south to southeast wind. The "wood gang" took the scow and brought some wood. Rafters were put in the herders' house for the floor, and window frames fitted in. The sick deer was still unable to move. The two stray deer were returned to the herd. Carl Brevig celebrated his first anniversary by inviting the white population at the station to dinner. Interest in the day school seems to be decreasing, but evening school is well attended.

September 21, 1894.—A stormy and rainy day; wind south; the surf going over the bank into the mouth of the creek.

September 22, 1894.—The wind and rain storm continues. A female deer was found dead near the herd; liver disease.

September 23, 1894.—The storm continues; the wind blew with unusual force about 5 a. m. Wind south to east-southeast, abating toward dark. The usual Sunday service and school. About 3 p. m. Frederick had the mishap to wound both hands by the discharge of his gun escaping by the breach instead of the muzzle. The muzzle was stopped with a plug of wood and a spike so securely wedged in that the firing of the gun could not expel them. His hands were badly torn and blistered by powder. A dressing of arnica and laudanum was put on. Some Cape Prince of Wales people said they had found a dead deer near the inlet into Grantley Harbor; also killed a sick deer that had swollen legs. The meat was already consumed.

September 24, 1894.—A nice day, with light northeast wind. At 10 a. m. Brevig and five natives started for Cape Prince of Wales in the whaleboat.

September 25, 1894.—Strong southeast wind and heavy rain all day. A workshop for the natives was commenced.

September 26, 1894.—Southeast wind. A deer that had been missing came back sick; another sick deer has strayed.

September 27, 1894.—A nice, clear day; wind from the north. The sick deer was found lying down in some bushes; it is now kept separate from the herd.

September 28, 1894.—Northeast wind, gloomy. No report from the deer.

September 29, 1894.—North wind, bright and clear. Three sick deer were killed, that the meat could be used for the herders. There are yet two sick deer in the herd.

September 30, 1894.—Northwest wind; a pleasant, clear day. Herd all well.

October 1, 1894.—Strong northwest wind, with a little rain and snow. Wocksock moved into the east end of the new house. Brevig and natives arrived about 10 p. m., having made the trip in nine hours. The boat was sailed to the cape Saturday night. Storm and strong south wind kept them for two days near Kinnowyok, and Wednesday

morning Poloynuk was made, and from there Moses and Brevig walked, climbing the highest mountains and arriving at Cape Prince of Wales at 3 o'clock in the afternoon. Sunday he married Netoxite and Kinnowyok, the first native couple married according to civilized custom in northwest Alaska. On the return trip the boat was caught in a squall and Brevig's shotgun was lost overboard.

October 2, 1894.—A fair day, with north wind. A fishing party was sent up to the lakes. All well at the herd.

October 3, 1894.—Snow and sleet. Wind northeast, southeast, south-southwest, clearing up with a west wind in the evening. No report from the herd.

October 4, 1894.—Northeast wind, with snow and sleet. Two more deer sick and all efforts to find the missing bull have been in vain. The fishing party returned with a good supply of tomcod, herring, and other fish. The evening school is well attended.

October 5, 1894.—Cloudy, with snow and sleet all day; wind northeast to north-northwest. A woman at Nook committed suicide by shooting herself; she had been demented for some time.

October 6, 1894.—Strong northwest wind, cold and blustering, blowing a gale during the night. Kjellmann and Brevig visited the herd and counted the deer, and from various counts by both it was agreed that the flock contained 440 deer. They were in good condition. It was decided to move to a place about 5 miles up Grantley Harbor, as it was thought the prevailing disease was caused by some herb consumed with the moss.

October 7, 1894.—A cold, blustering day; east wind, with snow flurries. The usual Sunday exercises, with but few Lapps present.

October 8, 1894.—South wind; rain, snow, and sleet. Kjellmann and herders brought a float of wood.

October 9, 1894.—Northwest wind, cold and blustering. The herd was moved 5 miles east on the banks of a river entering Grantley Harbor.

October 10, 1894.—North wind; fair day, with ice forming on the ponds and lagoon. Many applications for medicines for colds, sores, and sore eyes. No report from herd.

October 11, 1894.—Clear, with a zephyr from the northwest. The snow disappeared around the house and on the beach. A woman came for treatment; by accident she was shot in the fleshy part of the leg with a revolver. The wound was ulcerating and the ball in the wound. I did not have the instruments or knowledge to extract the bullet, but the wound was cleaned and dressed. Many patients come for medicines. The dressing doctor seems to have lost patronage lately.

October 12, 1894.—Gentle northeast wind. One more deer sick. A sealing party, consisting of Kummuk, Sekeoglook, Oowkitkoon, Electoona, Ahlook, Taootuk, and Soovawhassie, were sent to Point Spencer this morning, Wocksock, Martin, and Charley remaining at the station. Ookwoodlet came back yesterday and desired to leave the station. He

was paid for his two deer and left. Johan and Mikkel were out in the whaleboat to hunt for material for sleds, etc. Sugar dropped into the mouths of little children seems to be a very strong drawing card for them to come to school. The Lapps reported having seen tracks of two wolves near the herd.

October 13, 1894.—North breeze; cold, clear, and nice. Kjellmann brought home a raft of logs for firewood. Considerable fever, sore throat, and headache prevail at the station.

October 14, 1894.—North wind, dark and gloomy. The usual Sunday services. The Sunday school was called, but the audience forgot to appear.

October 15, 1894.—Calm, clear; thermometer, +20° all day. Per Rist, in going out to the herd with his week's supply on his back, tried to cross the ice on one of the lakes back of the station and fell in. His artega buoyed him up until he reached solid ice.

October 16, 1894.—Strong east wind, +19° to +23°. Oowkitkoon and Martin were sent out to gather moss. No report from deer.

October 17, 1894.—Light east wind, +23° to +42°, clear and mild. An iceboat is under construction.

October 18, 1894.—Light east wind, clear and fine, +25° to +38°. The smithy was completed to-day and tried in the evening. The natives had gathered during the day to see the wonder. They smelt the forge, and put their noses as near the furnace as the extremity would allow. When they saw the iron become red, and the iron was put on the anvil and the sparks began to fly, they sought the outside, helter-skelter, and now only two of the bravest here have the courage to peep into the shop. No report from the deer.

October 19, 1894.—Zephyr from the north, clear and nice, +26° to −35°. No report from the deer. The moss gatherers returned in the afternoon.

October 20, 1894.—Calm, cloudy, mild; occasional snow flurries. One female deer died yesterday and one to-day from the prevailing disease. +27° to +39°.

October 21, 1894.—Sunday; the usual service and school. Clear, calm, mild, +25° to +40°. All but one of the last litter of collie pups have been traded to the natives.

October 22, 1894.—Clear, calm, mild, +21° to +36°. Wocksock and Martin piled up wood along the beach.

October 23, 1894.—The sun rose, ascended, culminated, descended, and set. The thermometer began its diurnal course at +10°, ascended to +30°, and descended to +12°. After evening school the native boy element came into the schoolhouse with their faces painted and crawling on all fours. The masquerade ended in a plaintive cry for "cow cow" (food).

October 24, 1894.—Calm and clear, +13° to +27°. A load of wood was brought home. Twenty-six Eskimo children attended school to-day.

October 25, 1894.—Southeast to southwest wind, cloudy and gloomy. The sealing party was visited and five seals brought back as the outcome of two weeks' hunt. Mathis and Peter arrived with two deer to take provisions out to the camp. Thermometer, +10° to +22°.

October 26, 1894.—Light northeast wind, clear and bright. The sealing party arrived home. Jenny Kjellmann was sick from swollen tonsils and sore throat. Thermometer, +10° to +29°. No report from deer.

October 27, 1894.—Southeast wind; cloudy, with snow flurries. Frederick returned to-day, but failed to report. He had been very much frightened yesterday by hearing several shots fired at a distance.

October 28, 1894.—West breeze; cloudy, with snow flurries. The usual service and Sunday school. Toward evening Thorwald Kjellmann and I visited the village and entered several houses, and found them much better than we had expected; they were warm and had floors, one bed, and bunks for beds. Thermometer, +8° to +16°.

October 29, 1894.—Calm, clear, and cold, 0° to +2°. The sealing party was hindered from going to Point Spencer by floating ice from Grantley Harbor in the bay.

October 30, 1894.—Partly overcast; calm, with snow flurries; thermometer, −2° to +12°. The Eskimo herders, and especially Moses and Martin, are showing themselves more and more lazy. All is well at the herd. Only small open spaces on the bay.

October 31, 1894.—Strong northeast wind during the night and forenoon, abating to +8° to +20°. The bay being clear from ice, Mathis, Moses, Oowkitkoon, and Charley went sealing. Tatpan and Wocksock are sick. The Lapps hauled two loads of wood with two deer and sleds, one man driving both. About 3 p. m. it commenced to snow, and 1 inch fell before it cleared. No evening school.

November 1, 1894.—Calm and clear, +14° to +20°. The sealing party returned walking, having left their boat. They could not reach Point Spencer on account of ice.

November 2, 1894.—Strong east wind, 0° to +8°. The day opened with a catch-as-catch-can fight between Mary and Nah yuk. Charley tried to mediate peace and was sent sprawling to bed by his "better half," and her opponent sent sprawling to the floor headforemost. All is well with the herd. Wocksock is worse and the Lapps have tried bloodletting, and in the evening a woman from the town tried her bewitching ceremonies on him. He was worse from lying naked on the floor, exposed to a draft. I took my medicines home. The bay is covered with ice.

November 3, 1894.—Light east wind, +8° to +28°; clear. The ice boat was rigged up to-day. Electoona and Taootuk came in with a deer and sled each. Samuel drove an untamed deer. Two parties from the lakes reported the ice safe on the river.

November 4, 1894.—Light wind from the east, clear and nice. The usual Sunday service, with a very scant attendance by Lapps and

Norwegians. The Sunday school was well attended. Thermometer, 0° to +8°.

November 5, 1894.—Clear and calm; thermometer, −2° to +2°.

November 6, 1894.—East wind, −2° to +4°. Samuel, Electoona, and Taootuk went to the herd, and Charley Kummuk, Moses, Martin, Johann, and Mikkel went out for wood and logs for a stable. The ice boat was used for the first time to-day and went nicely. The ice was rather rough. No deer report.

November 7, 1894.—Overcast, with light northeast breeze, +10° to +30°. Sekeoglook was brought in to-night from the herd, having cut his leg in erecting a tent; the bone was touched; I dressed it. Three deer are reported sick.

November 8, 1894.—Cloudy and milder, +10° to +22°. Two deer are now kept at the station to haul wood. Sekeoglook's leg is doing nicely. A strong north wind all night; it took the mast from the ice boat.

November 9, 1894.—A full-fledged snowstorm, with north wind; snowing all night and day. Only two herders attended the evening school; 7 at the station. Thermometer, +10°.

November 10, 1894.—A gale (with capital G) from the north awoke the silent echoes of the night and the new-born snow from its innocent sleep about 1 a. m., forcing the fleecy crystals to seek shelter behind hills, in ravines, behind logs, and inanimate objects bigger than themselves. Millions and millions had found an asylum in the trade room, where they had jumped into boxes and barrels and scaled the shelves; some had been satisfied with the bare floor, some had clustered under the ceiling and stovepipe upstairs, some had crawled into deerskins, and some had even tucked themselves snugly into the Lapp boots. Thermometer, +10° all day. No report from the deer.

November 11, 1894.—North wind very strong; storm abating during the day; cloudy. Service and Sunday school; +9° all day. No report from the deer.

November 12, 1894.—Light northwest wind; cloudy, with snow flurries. The skee was used for the first time; it was used by the Eskimos, and they managed to land on their backs, without any ceremony, in the snow. No deer report. Thermometer, +11° to +16°.

November 13, 1894.—South-southwest to west-northwest wind; blowing hard from southwest at noon, and piling the ice up high on the beach; +9° to +21°.

November 14, 1894.—Northwest to southwest wind; cloudy, with a little snow. Thermometer, +20° to +31°.

November 15, 1894.—Northeast to east-southeast wind, strong in the afternoon. Samuel and Per Rist came on late last night with the carcass of a male deer that had broken its head in trying to break loose from its fastenings. Five deer are now under training for the sled Frederick and Martin are hauling wood every day with three deer. Thermometer, +18° to +2°.

November 16, 1894.—A gale from northeast since midnight; snow drifting bad. Zero all day. Frederick and Martin brought moss and two extra deer.

November 17, 1894.—Strong northeast wind all night and day. Cloudy and cold, −12° to −2°. Soovawhasie was paid for his two deer in the evening, as he wants to quit herding.

November 18, 1894.—The usual service and Sunday school. The forenoon service was well attended by natives and most of the Lapps. The Sunday school was attended by but a few. Soovawhasie left for home this morning. Light east wind; thermometer, −8° to −4°.

November 19, 1894.—Light southeast wind in the morning and strong north wind in the evening; clear; −8° at 8 a. m., +22° at noon, and −2° at 6 p. m. Charley shot another seal. Considerable fish was traded from the lake people.

November 20, 1894.—Clear, cold in the forenoon; in the afternoon a strong north wind, with a chilling mist; −12 to +20°.

November, 21, 1894.—A gale from north during the night and blowing a storm all day; cloudy and snow flurries. About 9 p. m. fire caught in the wood behind Kjellmann's bedroom stove and ignited the wall behind it. The fire was discovered before any damage was done. Frederick, Mikkel, and Johann went out after moss this morning early and will be gone three days. Thermometer, −2° to +12°.

November 22, 1894.—Medium strong north wind, clear, −4 to +2°.

November 23, 1894.—Light northeast wind, cloudy, −12° to −2°. The moss men returned in the evening, and Moses and Per from the herd. The water gave out in the creek some days ago, and ice is the staple article now.

November 24, 1894.—Strong southeast wind all night, becoming a gale in the morning; +18° to +22°. My stovepipe blew down about 11 p. m., and soon after the cask supporting the station school bell blew over into the ditch. The snow in the ditch saved the bell from being broken; some of the castings are broken. The wind lulled at noon, but now it is blowing harder than ever.

November 25, 1894.—The storm continued all night; about midnight the house shivered and shook on its foundations. Cleared at 1 p. m. and changed to southwest, veering to southeast again with very strong wind. Thermometer, +24° to +28°. The usual Sunday service and school.

November 26, 1894.—Strong southeast wind all night and morning, +22° to −26°. The bell was rigged up again. None of the boys at the evening school; 6 at the station. Wood hauled with deer.

November 27, 1894.—Winds blowing from all directions except northwest; zero all day; clear.

November 28, 1894.—Strong east wind; cloudy, with snow flurries The ice broke up in the bay in the afternoon and fear was entertained for Kummuk and Wocksock, who left yesterday for the sandpit with a

LASSOING REINDEER, SIBERIA.
Photograph by William Hamilton.

dog sled with only nine biscuits between them. The dogs ate two dog harnesses and a seal skin last night. Zero all day.

November 29, 1894.—Strong northeast wind. The bay clear of ice. The ice boat anchored outside had disappeared. Kummuk and Wocksock returned in the evening, having traveled all round the bay. No school, but nearly the whole day was spent in visiting sick people in the village. Time commences to drag heavily. Thermometer, +18° to +26°.

November 30, 1894.—Calm and cloudy, with snow in the evening. A sled arrived from Golovin Bay with letters for Kjellmann and Lopp. Thermometer, +10° to +15°.

December 1, 1894.—Light east wind, cloudy and snowing, +14° to +22°.

December 2, 1894.—North wind, colder, +12° to +2°. The usual Sunday service and school. About noon the strong wind broke the ice, and some women out fishing were carried along out toward the sea. Mr. Kjellmann with a crew in the lifeboat rescued them.

December 3, 1894.—Northwest "sailor's breeze," with damp, penetrating wind. Evening school poorly attended; +4° to +10°.

December 4, 1894.—Northwest wind, cold and blustering, −6° to −10°. The moss party returned.

December 5, 1894.—Strong northwest wind, cloudy, −8° to −12° Mrs. Kjellmann sick.

December 6, 1894.—Clear, calm, cold, −9° to −18°. Mrs. Kjellmann better. Karl Brevig sick with fever.

December 7, 1894.—Cold, calm, clear, −18° to −22°.

December 8, 1894.—Calm, clear, cold, −16° to −23°. Mr. Kjellmann put up another stovepipe.

December 9, 1894.—Clear, calm, cold, −14° to −20°. The usual Sunday service and school. The leading shaman had a confab with the spirits to-night. He had four fires burning in a square and reposed himself in the middle, groaning and sighing. Four new doctors were with him guarding the fires; Charley was one of them. Thorwald Kjellmann went out there to see the show, and the guards vanished, and he, thinking it was a sick man left there to die, spoke to him, but received no answer. The Lapps were cautioned by Mary not to look toward the fire.

December 10, 1894.—Calm and bright, −14° to +20°. Charley and Mary inspected Thorwald Kjellmann's feet and asked if they were not stiff or swollen, because he had spoken to the shaman.

December 11, 1894.—At 1 a. m. three sleds arrived from Cape Prince of Wales with letters from Mr. Lopp. No pupils from the village, as a dance was in progress all day; −14° to −22°. The Lapps returned.

December 12, 1894.—Light northwest breeze, clear, −14° to −20°.

December 13, 1894.—Clear, calm, hazy, −14° to −18°. Soovawhasie

arrived early this morning with dog team to take his goods home. The Lapps have been hauling wood to-day.

December 14, 1894.—Light northwest wind in the morning and clear; at noon a gale, and snow flying; −14° to −25°. The cape sleds left early this morning, and Kjellmann with the Lapps and herders at the station left for the timber beach to stay till Saturday to pile up wood and logs, but returned at night on account of the storm; some were frostbitten.

December 5, 1894.—Clear, with light east wind; −20° all day.

December 16, 1894.—Strong east wind in the morning and blowing a gale toward evening, the thermometer suddenly rising at 4 p. m. from −14° to +2°. No Sunday service, but Sunday school.

December 17, 1894.—Strong west wind, clear, −8° to −14°.

December 18, 1894.—Clear and calm, −14° to +18°. Kjellmann went out to the herd to return to-morrow. Sekeoglook is now walking about.

December 19, 1894.—Stormy, with northeast wind during the night, veering to south and snowing in the morning; −14° to +30° in the evening, and the snow turned to sleet. Kjellmann returned about noon and in the evening the Lapps came in.

December 20, 1894.—Light southwest wind, clear, +18° to +22°. Two sleds returned with moss and small willow bushes for Christmas.

December 21, 1894.—The sun rose at 11.40 a. m. and set at 2.50 p. m. Light northeast wind, clear, +18° to −2°. Three deer were killed to-day for meat, the herders getting one and the Lapps the other two. At 2.30 Mrs. Johan Tornensis was delivered of a big boy, but through some bungling of the Lapp woman attending her, the child died soon after its birth. The mother is doing well.

December 22, 1894.—Light northeast wind, cloudy, −6° to +10°. Considerable wood was hauled with deer to-day.

December 23, 1894.—Wind southwest, northeast, and southeast, growing stronger; after dark a little snow; +18° to +22°. Sunday school, but no service.

December 24, 1894.—Light northeast and south wind; clear, nice day; +26° to +30°. The station has been crowded with natives all day persisting in seeing everything. At 5 p. m. the doors were opened and the room was soon filled with children and adults. Several songs were rendered, and after a short talk on Christmas, the goody-goodies were distributed. During the day every house in town had received Christmas cheer in the form of "cow-cow" (food).

December 25, 1894.—Calm and cloudy. Service in the forenoon. In the evening the Eskimo herders were gathered and some games were played, songs sung, and coffee and tea served. At 8 p. m. a gale blew up from south to southwest, with rain and sleet; +30° all day.

December 26, 1894.—The gale continued all night; in the morning it veered around to northeast and blew in gusts. Yesterday Electoona was caught gambling with Nau u gok, a low character that loafs around

the station considerably. He was turned out and forbidden to enter that house anymore. The Brevigs visited the Kjellmanns in the evening. Thermometer, +10° to +21°.

December 27, 1894.—Wind continued all night; cloudy, and some sleet in the evening from the southeast; +20° to 28°.

December 28, 1894.—Strong northeast wind, cloudy, mild, snowing in the evening; +24° to +30°.

December 30, 1894.—Calm and clear, very fine day. Sunday school. The sun set at 3.04 p. m. Sekeoglook had his hand scalded by hot tea.

December 31, 1894.—Clear, calm, fine day. Sun rose at 11.30 a. m. and set at 3.09 p. m. The Nook people received a present of flour and biscuit to-day. Late last night Mrs. Kjellmann found a pair of mittens that Thorwald Kjellmann lost last fall, by being stolen from him, in the possession of Isah genna. He said he had gotten them from his brother Charley. Moses left toward evening for Charley's brother's place to get dogs to go to Cape Prince of Wales to the dance. Thermometer, +2° to +4°.

January 1, 1895.—Calm, clear, bright; −2° to +10°. Service for the Lapps. In the afternoon I had five patients, Mrs. Wocksock, Sekeoglook, a boy from Nook covered with sores from the waist down, and a woman from town with a rebellious tooth, which was extracted. Thorwald Kjellmann celebrated his sixty-eighth birthday to-day.

January 2, 1895.—Bright and calm; −4° to +2°. School commenced after Christmas, and 29 showed up bright and early to get the biscuit. Two sleds arrived from the lakes for the dance.

January 3, 1895.—Light northeast wind, clear and bright; sunset 3.31 p. m.; −6° to +4°.

January 4, 1895.—Calm, foggy; +9° to +16°. Sleds are arriving all day, and more are expected. When all have arrived they will leave in a body.

January 5, 1895.—Clear, bright, calm; −5° to +8°. Three sleds arrived toward evening, making the number complete. They will leave early to-morrow. Mrs. Kjellmann and Brevig had a trip behind reindeer to-day, and enjoyed it.

January 6, 1895.—Mild, calm, foggy. The "carnivalites" left at early dawn, 9.30 a. m. Johann Tornensis's body was buried to-day and a burial place dedicated on the east side of the little creek east of the station house. Little before dark Kjellmann and wife, Mikkel, and myself went out for a drive with the deer and steered for Nook, where I saw a patient that, from descriptions of his ailment, I had been treating for bleeding from the lungs, and found him suffering from acute rheumatism and swelled joints. Arrived at the station at 7 p. m. Thermometer, −2° to +8°.

January 7, 1895.—Calm and clear; −11° to −2°. In the afternoon Kjellmann, Nakkila, and Wocksock left for the upper lakes to get birch

poles for harnesses, and will be absent four days. Frederick was taken sick toward evening.

January 8, 1895.—Calm and foggy; −9 to +2°.

January 9, 1895.—Breeze from north-northeast, clear, snow flying; −3° to 0°.

January 10, 1895.—Light north wind, calm after dark; −15° to −3°; overcast in forenoon, clear in afternoon.

January 11, 1895.—Strong northwest wind; partly overcast; −17° to −22°, growing colder.

January 12, 1895.—Strong northwest wind, stormy; −23° to −20°. Kjellmann and party are yet absent, and anxiety is shown, especially by Mrs. Nakkila. The wind is against them, and they may have sought shelter in an Eskimo house.

January 13, 1895.—North wind and overcast in the forenoon, clear and calm in the afternoon. Jenny Kjellmann froze her nose playing around the house; −24° to −30°. Sunday service. Kjellmann and party returned shortly after dark with only one frozen nose to Jack Frost's credit. The first day out they had traveled about 70 miles. On the return the deer got tired and unwilling, and but small progress was made. The skees are becoming a favorite among the herders, and all want a pair.

January 14, 1895.—Light northeast-east to southeast wind; −33° to 31°. As yet we have not seen a genuine Minnesota cold or blizzard, but live in shaking expectation of seeing one before next May.

January 15, 1895.—Light southeast wind, cloudy. Thermometer stationary at −14°.

January 16, 1895.—Calm, cloudy, with two hours sunshine about noon. Thermometer, −6° to 0°.

January 17, 1895—Calm, clear; −9° a. m., 0° 2 p. m., −19° 5 p. m. About 7 p. m. a native arrived from Golovin Bay with letters and barter goods, traveling for Mr. J. Dexter. That he was from the vicinity of Swedes was betrayed by the snuffbox, which he handled with Swedish gracefulness.

January 18, 1895.—Light southeast wind; −19° to −16°. Two sleds arrived from the cape toward evening. Letters were sent to Mr. Lopp by the trader.

January 19, 1895.—Strong northeast wind during the night, light southeast during the day; −19° to −14°. Mrs. Kjellmann was taken very sick during the night. Charley, the herders, and several sleds returned to-night from the cape, all complaining of being cold.

January 20, 1895.—The usual Sunday service and school. Strong southeast wind all night, light wind during the day; mild overcast, with some snow falling; +10° to +14°.

January 21, 1895.—Southeast gale; cloudy, with snow and sleet; +22° to +28°. A sewing school for Eskimo girls was begun to-day with 11 in attendance. Evening school is attended by 4 herders.

January 22, 1895.—Calm, overcast; +14° to +26°. Aslak made himself a bed. Natives are trading biscuit for grouse still on the wing.

January 23, 1895.—Overcast and clear; 0° to −4°. The sleds with the supplies departed for the lakes to-day. The Lapps are hauling wood.

January 24, 1895.—Calm and clear in forenoon; north wind in evening; −4° to −3°.

January 25, 1895.—North-northeast wind medium, becoming stronger; −2° to −6°. Mail and presents to the herders arrived from Mr. Lopp.

January 26, 1895.—A gale from north-northeast, snow drifting bad; +16° to −15°.

January 27, 1895.—The storm continued all night and day; −16° to −22°. The usual Sunday service and Sunday school.

January 28, 1895.—Storming and drifting still from north-northeast; −4° all day. Charley should have picked out his herd to-day; storm prevented it.

January 29, 1895.—Storming still; no herd separated. Kjellmann has made two wooden shovels. Per's deer that he was breaking broke loose from him and started for the herd. Thermometer, −4° to 0°.

January 30, 1895.—Storming still from north-northeast; clear, but snow flying; 0° all day. All herders and Lapps but Solon, Per, and Ahlook were sent to the herd to help Charley separate his herd to-day.

January 31, 1895.—Clear, snow flying, strong north-northeast wind. Kjellmann left for the herd early this morning and Charley's deer were separated and taken behind the bluff across the bay; 115 deer (15 his private property) were taken, 90 females, 3 sled deer; the rest were bulls and geldings. The south side of the house was now so completely blocked up that a tunnel had to be dug through the bank to get an entrance to the schoolhouse.

February 1, 1895.—A howling north-northeast wind all night and day. Charley received his equipment and made preparations to leave for his future home to-morrow. Kutchuk, Dexter's trader, arrived to-day from the cape with letters from Mr. Lopp. Thermometer, −4° to −10°.

February 2, 1895.—Still storming from north-northeast; clear, but snow flying; doors and windows on the south side of the house entirely blocked up by snow. Charley and family left about noon. Aslak, Moses, and Ahlook will help him with the deer. Thermometer, −4° to +12°.

February 3, 1895.—Clear, bright, calm; −3° to +2°. The usual service and school. Tunnels were dug for doors and windows.

February 4, 1895.—North wind puffy. Partly overcast. Sun rose 9.45, set 4.45. Thermometer, +5° to −10°.

February 5, 1895.—North wind, very hard storm during the night, continuing in puffs all day, some snow; −4° to −8°.

February 6, 1895.—Strong west wind, overcast with a little snow;

—18° to —14°. The herders have long been very negligent in bringing wood for the schoolhouse, and long ago refused to make the fire and sweep the room.

February 7, 1895.—North-northwest wind; a genuine, full-fledged blizzard; the wind blowing a gale; snow flying so thick that you could not see 20 feet, and mercury —22° all day. No pupils and no school.

February 8, 1895.—North wind strong, but abating; —24° to —20°. Yesterday the herd split and only 20 deer remained around the tents, the rest had gone across Grantley Harbor and were found and brought back by natives from Nook. The watch had divided, two in each party, at 3 p. m., seeking in all directions but the right one; 8 pupils at evening school.

February 9, 1895.—Clear, bright, and calm; —26° to —20°. Stone was brought down from the hills for a fireplace in Charley's vacant house.

February 10, 1895.—North-northeast gale, the strongest wind since we came here; all doors and windows on the lee side blocked, the only egress being by the store door. Per came in through the storm and reported the herd gathered and not storming much where it is. Thermometer, —16° all day.

February 11, 1895.—Blizzard all day; —2° to —12°. Frederick was brought in from camp frost-bitten, having frozen his lip in some manner. Samuel is now alone with the deer.

February 12, 1895.—Calm, mild, snowing; +16° to +24°. Hauling and cutting wood and shoveling snow is now the daily routine. Per has lost his dog and is afraid it is caught in a trap, as it is his constant companion.

February 13, 1895.—Clear, calm, mild; +20° to +14°. The fireplace is ready in Charley's house. Mrs. Kjellmann hurt her ankle in sliding down the snowdrift; it is swollen.

February 14, 1895.—Strong north wind, clear; —10° to —4°. No valentines in circulation.

February 15, 1895.—Strong north wind. Aslak and Moses returned in the night; they had left one of their deer on the other side of the bay without making it fast. Moses wanted to tie it, but Aslak let it loose. They were sent back again to hunt for the "needle in the haystack" this morning. Another deer they had let loose near the station, and Aslak was told to find the deer or pay for them. Thermometer, 0° to —2°.

February 16, 1895.—Strong north wind, clear; —2° to —8°. Aslak and Moses returned in the night, minus the deer; no trace of it was found.

February 17, 1895.—Strong north wind, clear. The usual service and Sunday school; —6° stationary. Mrs. Kjellmann's foot is better.

February 18, 1895.—A furious gale from north, snow flying, clear; —18° to —14°; slight shock of earthquake was felt at 5 p. m.; the wind took a rest about 6 p. m.

February 19, 1895.—Medium north-northeast wind, clear; −16° to −14°. Mrs. Kjellmann's foot bad.

February 20, 1895.—The wind running all around the flag pole, and sometimes a calm. The Lapps were sent after moss to-day; −20° to −6°.

February 21, 1895.—Southeast wind, light, clear, and nice; +20° to +24°.

February 22, 1895.—Strong north-northeast wind, overcast. The flag was hoisted in honor of the Father of Our Country. About 8.30 Mr. George Johnson, from Unalakleet, with two interpreters, arrived, having made the trip from Charley's place since 8 a. m. They are on a missionary trip through this part of Alaska and will remain here some days. Aslak has found one of the missing deer. Thermometer, +12° to +3°.

February 23, 1895.—Strong north-northeast wind; snow drifting; −8° to 0°. Moss party returned.

February 24, 1895.—Storm from north-northeast, snowing and drifting. Johnson preached with the assistance of the interpreters. In the afternoon Taootuk was married to Nah zoo kah and tea was served to all the Eskimo herders. A sled arrived with letters from Mr. Lopp; −18° to −19°. Charley's brother and brother-in-law arrived about dark.

February 25, 1895.—Strong north-northeast wind. The Lapps hauled wood, and Ivanhoff, Johnson's interpreter, went with them on the trip. Thermometer, −20° to −16°.

February 26, 1895.—Light north wind, clear; −20° to −22°. Johnson left at 10.30 for Cape Prince of Wales, and Charley's brother and brother-in-law for Charley's place. Aslak, Martin, and Oowkitkoon went out in search of the missing deer. Taootuk, Wocksock, and Kummuk went up the coast to Kinnowgok, seal hunting.

February 27, 1895.—Clear, cold, calm; −24° to −15°. Aslak and others returned late last night, having tracked the deer to the top of the mountain toward Charley's place.

February 28, 1895.—Light north wind, overcast. A beautiful aurora borealis in the evening; −21° to 6°.

March 1, 1895.—Strong east wind in the night, becoming light during the day; clear in the forenoon, overcast in the afternoon. Wassock from Nook, was taken violently sick in the morning and was taken home. Johann, Moses, and Sekeoglook came down from the herd.

March 3, 1895.—Light south wind, changing to north. A light fall of snow. The usual Sunday service and school. Thermometer, +10° to +25°.

March 4, 1895.—Cloudy, with wind from northeast, east, southeast, and south. Kjellmann has finished his tent and camping outfit. Moses, Tatpan, Ahlook, and Johann went out to the herd. The village seems deserted; only two children from the village to-day. Thermometer, +25° all day.

March 5, 1895.—Rain during the night, in the forenoon sleet and snow; +25° to +33°. Ahlook returned, having lost the tent and slept on the mountains.

March 6, 1695.—East wind, veering to south and southwest; snow flying all day; cloudy; +10° to +25°.

March 7, 1895.—Southwest wind, cloudy and snowing; +25° all day. Ahlook left for the tent to-day.

March 8, 1895.—A clear, beautiful day, calm. A native reported having seen the lost deer. Thermometer, +10° to +26°.

March 9, 1895.—Calm; +12° to +22° to −2° at 8 p. m. At 9 p. m. the windy corner opened up and soon a gale was blowing from north-northeast. Kummuk returned during the night with two seals. Taootuk had shot three. Mr. Johnson returned about noon, having camped on the snow at the head of the lagoon. Also some traders came from the cape, and Tatpan, Martin and Oowkitkoon.

March 10, 1895.—North wind; −10° to −15°. Johnson preached in the village in the forenoon, and in the evening Norwegian services.

March 11, 1895.—Strong northeast wind, with snow flying. Thermometer, 0° to +18°. Kjellmann, Martin, and Mikkel left for Golovin Bay with deer to-day. Service in the evening.

March 12, 1895.—Wind shifting about, settling into a northeast gale during the night. Two services during the day. About noon the Cape Prince of Wales sleds and Lopp's herder left, with Moses in tow. Thermometer, +12° to +20°.

March 13, 1895.—Strong northeast wind, cloudy. Johnson did not leave on account of drifting snow; +10° to +18°.

March 14, 1895.—Light northeast wind, overcast; zero to +12°.

March 15, 1895.—Medium strong north wind, overcast. Johnson and company left at 8 a. m. Thermometer, +5° to +12°.

March 16, 1895.—Wind changing from northeast to southeast; north-northeast, settling at east, cloudy; +2° to +22°. The herd reported all well.

March 17, 1895.—Clear at times, wind continually changing; −10° to −15°. Sunday school in the afternoon.

March 18, 1895.—Clear, with north-northeast wind; −2° to −12°. Frederick was sent up to the herd, as his hip is now healed.

March 19, 1895.—North-northeast wind, clear; −3° to +4°. Charley arrived at 2.30 with letters from Johnson and Kjellmann. They left his place the 15th for Golovin Bay. One deer reported sick of a hurt foot. Mathis asked permission to kill it, but Per was ordered to go and look at it, and if it could be saved to try his best.

March 20, 1895.—Strong north-northeast wind, clear. The deer, a two-year-old gelding, was brought in, killed, and was dressed here and the meat put in the storehouse. The right front hip-joint was dislocated and matter had commenced to form around the joint. Thermometer, −11° to +2°.

March 21, 1895.—The windy corner wide open the entire twenty-four hours; −12° to −4°. Taootuk and Wocksock returned to-night from sealing, minus any seal. Mrs. Kjellmann had a sick headache all day.

March 22, 1895.—Strong north-northeast wind, clear; −21° to 10°.

March 23, 1895.—Medium strong northeast wind, clear, cold; −22° to −14°.

March 24, 1895.—Clear, light east wind; −19° to −8°. The usual Sunday school.

March 25, 1895.—Light southeast wind, clear and nice in forenoon, changing to northeast, and a storm was on the programme; −18° to −6°.

March 26, 1895.—Clear, with north-northeast wind during the night; calm in the forenoon; strong north to north-northeast wind in the evening; −10° to −2°.

March 27, 1895.—North wind, light, clear; −11° to −6°.

March 28, 1895.—Light north wind, clear; −17° to −10°. Per thinks the cows will come in from April 15 and on. Very strong north-northeast wind; some snow flying, clear. The deer which Aslak lost was reported killed by a native and consumed. Thermometer, −22° to −12°.

March 30, 1895.—Very strong northwest to north-northeast wind, overcast with snow flurries; −22° to −8°. Geetaugee was around hunting for four deerskins that had been stolen from him while he was out seal hunting. He suspects Nanugok (the thug) of stealing them. Geetaugee wants to enter a complaint against him when the revenue cutter comes.

March 31, 1895.—Overcast morning and evening, clear the middle of the day. Service and Sunday school. At 5 p. m. Kjellmann and Mikkel arrived with deer. They had left Charley's place at 8 a. m. and crossed the mountains. Martin is expected with a dog sled some time to-night. They left Golovin Bay on Monday noon. Thermometer, −12° to 0°.

April 1, 1895.—Overcast and calm. The man who shot the stray deer proved to be from Nook. He acknowledged the deed and on being told that he would either have to be put in irons or pay for the deer, promised to pay in fox skins before the *Bear* came. Two men had helped him eat it, and their names were taken and told to help pay for the meat. He threatened to commit suicide rather than be put in irons. Thermometer, −12° to zero.

April 2, 1895.—Northwest wind; partly overcast. The "Deerslayer" & Co. were in and each agreed to pay one white fox skin. A sled arrived from Golovin Bay bringing some letters from the States sent from Unalaska by way of St. Michaels. Thermometer, +12° to +4°.

April 3, 1895.—Calm, clear. A woman from the lakes came in with a two-months-old baby for treatment; it was covered with sores from poor care and filth. One of the best sled deer broke a foot to-day, getting entangled in the preceding sled, and had to be killed. Thermometer, −12° to +4°.

April 4, 1895.—Clear, calm; −12° to +4°. Martin was very sick with

rheumatic pains in the hip joint. Frederick was on the sick list from a boil on the knee caused by a neglected frost sore.

April 5, 1895.—Calm, clear; −4° to +10°. About 10 a. m. Aslak, Somby, wife and daughter, left for Charley's place to take care of his herd until June. Taooluk and wife left for down the coast to buy crabs. Two sleds arrived from the cape and one from the lakes.

April 6, 1895.—Variable winds, light, clear, and nice; zero to −14°. Nanugok came down from the cape last night, and had, according to hearsay, threatened to kill Geetaugee this morning. Nanugok was up at the station nearly all day and denied having taken the skins. He said he was going to leave in the morning, as the people were talking too much. After supper he went down to the village and was shot through the breast by Geetaugee and buried in a snow bank north-northeast from the village. There was no excitement in the village. The ladies at the station were somewhat excited over the affair; also the Laplanders.

April 7, 1895.—Sunday. Light southeast wind, clear and nice; −2° to +18°. Services with communion. Sunday school in the afternoon. Per, Sekeoglook, and Wocksock went up to the herd to-night to make preparations for moving the herd.

April 8, 1895.—Strong southeast wind, foggy in the morning, clearing up; −6° to −14°. Mathis, Samuel, Kummuk, and Ahlook left for the herd to-day with five weeks' provisions, as the herd is going up to the Goweerook River. Elektoona will take the provision sled back. Martin and Frederick are getting better.

April 9, 1895.—Clear, calm, bright. Several cape and lake sleds arrived. Moses came back from the cape with letters; −2° to +20°.

April 10, 1895.—Overcast, mild, and calm. Thorwald Kjellmann and Moses brought wood, as Johann's eyes were very bad.

April 11, 1895.—Overcast, calm. Johann's eyes are still bad. Three deer had broken loose from the fastening and shaped their course to the mountains. Koketuk, from the cape, arrived to-day. Thermometer, +8° to +28°.

April 12, 1895.—Strong north-northeast wind; storming. Service in the forenoon. Kummuk senior and his brother-in-law brought tidings from the stray deer, and with Moses were sent out to track them. Johann and Frederick took the rest of the deer and finally caught them near the last camping place. Moses turned back on the way. Thermometer, +4° to −10°.

April 13, 1895.—Strong north wind; snowstorm. Kotetuk left in the morning, and in the evening Netoxite, Mr. Lopp's herder, arrived to bring Brevig's family up on a visit. Zero all day.

April 14, 1895.—Easter Sunday; service and Sunday school. North wind, clear, with a little snow going south; −4° to +4°. Brevigs visited Kjellmanns and Kjellmanns visited the Brevigs.

April 15, 1895.—North wind; clear; −4° to +15°. Elektoona arrived

from the herd and reported all well with the herd; the herders all with sore eyes. Several sleds arrived from the cape and lakes, all wanting lead.

April 16, 1895.—North-northeast wind; snow on the move; −10° to −2°. Taootuk arrived during the night with news from Charley's herd. Brevigs left for the cape at 7 a. m.

April 17, 1895.—Calm, clear; +10° to +6°.

April 18, 1895.—Clear, calm in the forenoon; east wind in the afternoon; +8° to +10°.

April 19, 1895.—Calm, clear, bright; +8 to +15°.

April 20, 1895.—Calm, clear; +12° to +16°. Some Nook people complained that they had nothing to eat and were given some dry tomcod and oil.

April 21, 1895.—Calm and clear; light east wind, with snow in the evening. Oowkitkoon and Sekeoglook came down from the herd without any permission.

April 22, 1895.—Cloudy and calm; a little snow; +8° to +15°. Frank Komeroff, J. A. Dexter's Russian trader, arrived to-day with two dog sleds of barter goods.

April 23, 1895.—Storm from south, with snow and fog; +10° to +25°. Komeroff is doing a brisk trade.

April 24, 1895.—Strong south-southwest wind, with some snow; +20° to −28°.

April 25, 1895.—South-southwest wind in the morning and north wind in the afternoon, with some snow; +18° to +30°. Komeroff's Eskimo man is sick in bed.

April 26, 1895.—Clear and bright, calm; +20° to +28°.

April 27, 1895.—Brevigs returned at 11.30 p. m., having made the trip from the cape in seventeen hours. Cloudy and snowing, with a light northeast wind. Martin cut himself with his own knife. By falling down the knife penetrated the throat, cutting into the flesh quite deep. Thermometer, +25°.

April 28, 1895.—Clear and nice in the morning, with increasing wind from north-northeast, becoming very strong toward night. The usual Sunday service and school. Thermometer, +20° to +10°.

April 29, 1895.—Clear, with drifting snow and very strong north-northeast wind, abating toward night; +4° to +12°.

April 30, 1895.—Clear and bright, with a light north-northeast wind. Komeroff and party left for Golovin Bay, and a sled also left for the cape in the morning. Thermometer, +8° to +20°.

May 1, 1895.—Clear and bright, with a light northwest wind. Elektoona is sick with diarrhea. Thermometer, +12° to +28°.

May 2, 1895.—Clear, calm day; −12° to −30°. Mathis Eira arrived from the herd, having been one day and two nights on the way. He reported 65 fawns, of which one was stillborn and one was killed because it had a twin brother, and the mother would only care for one.

The third was killed in the herd by being kicked by another deer. The deer are thriving, and the pasturage is splendid. The herd are in a protected place where the winds can not blow. Two cape sleds and Charley arrived toward evening.

May 3, 1895.—Clear and bright, with a light south-southeast wind changing to east-northeast; +12° to +32°. Elektoona quite sick.

May 4, 1895. Clear and bright; south-southeast wind; +10° to +31°. Charley left at 9 a. m.

May 5, 1895.—Clear and bright, thawing in the sun; +15° to +35°; calm during the day; strong north-northeast wind after sunset. The usual Sunday school and service.

May 6, 1895.—Partly overcast, a strong wind during the night from the north; +15° to +35°; thawing a little. A sled arrived from Unalokleet. Mathis Eira left for the herd with provisions.

May 7, 1895.—Overcast, with occasional glimpses of the sun. The wind changing from northwest to north-northeast, southeast, back to northeast; +25° to +33°. Signs of thawing. Taootuk returned from seal hunting in the night with his wife, but minus all signs of seal. Elektoona went up to the herd with two weeks' provisions for the herd. Taootuk and Martin also went up to stay with the herd. Wocksock and Kummuk came home. Several sleds were on the move toward the sandpit with all their possessions.

May 8, 1895.—Clear and bright, with a light thaw; +20° to −36°. South wind, changing to northeast. The natives all seem to be on the move from Nook and the lakes. Kjellmann and the Lapps have been hauling timber for the schoolhouse.

May 9, 1895.—Clear and bright, with a chilly northeast wind; thawing a little in the sun in protected places; +22° to +30°. The Lapps received their provisions with joy.

May 10, 1895.—Clear and bright, with a light north-northeast wind. Mrs. Brevig celebrated her birthday by having a severe headache all day. The Nook "deer-slayer" brought tidings that he had seen two deer and a young fawn on the other side of the mountains south of the bay heading this way, and he, with Mikkel and Johann, were sent out with four deer to see if they could catch them and ascertain to which herd they belonged. Thermometer, + 22° to +29°.

May 11, 1895.—Overcast, with thick fog in the mountains; +18° to −31°. The Lapps and companion returned at 9.30 p. m., having followed the track of the deer all day, but never caught sight of them. A native reported that he had seen them pass northwest under the hills near the station one hour before the party returned.

May 12, 1895.—Clear and bright; thawing in the early afternoon; sharp, cutting north wind in the evening. The sighted deer were followed all day by the Lapps. Moses could not keep up and came home in the afternoon. The usual Sunday exercises. The herd was reported moved 10 miles nearer the station; 100 fawns, 4 dead. Thermometer, +20° to +35°. Letters arrived from Mr. Lopp.

May 13, 1895.—Clear, north wind. The stray deer were around the last camping place before Charley's herd left, and the deer had been tethered near by so that they should not scatter; but they had only circled around them, without coming near them, and turned northwest again, passing behind the hills. Thermometer, +25° to +26°.

May 14, 1895.—Clear and calm in the forenoon, with rising northeast wind in the evening; +14° to +33°. The deer have turned back again to the camping place and will be watched there until the herd returns.

May 15, 1895.—Clear and calm, +18° to +36°. The new schoolhouse was begun. Mikkel was out after the stray deer, without seeing them.

May 16, 1895.—Clear, with a very light northeast wind, growing stronger toward evening; +18° +35°. The deer were sighted behind the hills, but were very wild and could not be approached within half a mile.

May 17, 1895.—Partly overcast, with north-northeast wind during the night. Frederick, Kummuk, and Moses took a cook stove out to the proposed winter quarter for the herd, to be used for a herder's house. The natives have with one or two exceptions moved out of their huts, and are quartered on the beach or have moved to the sand-pit. School closed to-day. Oowkitkoon came with letters from the herd; all well. Thermometer, +19° to +31°.

May 18, 1895.—Overcast, with a chilly northeast wind; +18° to +30°. Trading sleds arrived from Cape Prince of Wales with letters from Mr. Lopp. Mrs. Kjellmann was sick from a headache.

May 19, 1895.—Overcast in the afternoon; mild and thawing; +23° to +40°. The usual Sunday service and school. The stray deer are yet behind the hills. Oowkitkoon started for the herd to-night.

May 20, 1895.—Cloudy and overcast, with south wind. Aslak Somby came back from Charley's about noon, and reported 77 fawns born, of which 2 were dead. He had been on the way since the 16th, having lost his way in the fog on the mountains. A fine, drizzling rain nearly all day; +42° all day; no frost in the morning.

May 21, 1895.—Clear, with a light southeast wind; +30° to +38°.

May 22, 1895.—Cloudy and raining part of the day; wind changing from southeast to north-northeast; −45°. Aslak and Frederick have been out looking for the stray deer, which are now moving toward the herd. Kjellmann made a few bricks to-day.

May 23, 1895.—Clear and bright until 6 p. m., when it clouded over and began to rain; strong north-northeast wind all day; +42°.

May 24, 1895.—Wind south and north; clear and mild; +51° at noon, thawing; colder at sunset, 10 p. m.

May 25, 1895.—Clear and calm, a very fine day; +50° at noon. Samuel and Taootuk came in from the herd and reported 132 calves born, 122 from old deer and 11 from young fawns. The herd is now near the foot of Grantley Harbor.

May 26, 1895.—Clear and calm in the forenoon; cloudy, with rising wind in the afternoon; northeast wind; +41° at noon, with a light

frost last night. The usual Sunday service and school. Aslak saw the stray deer near the first camping place in the fall.

May 27, 1895.—Clear, with a light northwest wind, veering to northeast; light frost last night; +30° to +42°. Johann, Frederick, Mikkel, and Wocksock went for logs again to-night. Kummuk returned to-night. The herd is now near the last camping place. Martin came in with Kummuk. A yearling cow brings forth a stillborn fawn. Light frost in the night.

May 28, 1895.—Strong northeast wind, clear and bright; +45°. Samuel, wife and child, and Martin went to the deer camp to-night.

May 29, 1895.—Clear, with a light north wind; −52°. Frederick, Mikkel, Johann and Aslak, Moses, and Kummuk went after logs late last night and are to make another trip again to-night.

May 30, 1895.—Clear, with a light north wind. The log cavalcade came home about 2 a. m. and left again at 4 a. m. Light frost; +52° at noon.

May 31, 1895.—Clear, calm; light frost in the night; +54° at noon. The log party returned to-night; they have brought some very nice logs. Salting seal blubber and drying the skins have been the order of the day for the Eskimo herders for two days.

June 1, 1895.—Overcast, with strong north-northeast wind. Early in the morning we got letters from Mr. Lopp. Per and Ahlook arrived from the herd. Per reported 131 fawns living and 13 dead, of which 9 were from the yearling cows.

June 2, 1895.—Clear and bright, with a strong north-northeast wind all night and day. Sunday services, but no Sunday school, as most of the herders were out. The toothache is making the station a much-felt call.

June 3, 1895.—Clear, with a light west wind; heavy frost last night. Per and Aslak went out to the herd; Frederick and Wocksock picked moss.

June 4, 1895.—Clear and bright, with a breath of wind from west. In the afternoon a cold, chilly fog came in from the northwest. A little cleaning up around the house was indulged in.

June 5, 1895.—Clear, bright, and calm. Toward night it clouded up from the south, with a little wind. Aslak came home with 7 deer, to be used in hauling logs.

June 6, 1895.—Overcast and calm, with a few drops of rain. Wocksock, Kummuk, Frederick, Aslak, and Thorwald Kjellmann went after logs. In the evening Jenny Kjellmann celebrated her sixth birthday by inviting her neighbors to supper.

June 7, 1895.—Cloudy, with showers all night and day; calm, and at times foggy. The log party returned at 9 a. m. Brevig and Thorwald Kjellmann went out for logs in the evening.

June 8, 1895.—Calm and foggy, rain and cloudy. The Alaska summer is here in all its abundance of rain and fog. Brevig and Kjellmann

ned at 7 a. m. with a log 36 feet long and 14 inches in diameter at nallest end. Frederick, Aslak, Kummuk, and Wocksock went at 4 p. m., followed by A. A. Kjellmann at 6 p. m.

), 1895.—Calm and foggy. The sun showed his benign counte- once for six minutes and the rest of the day we basked in fog. ne usual Sunday service and school. A boy from Kinnowgok reported two Russian men-of-war lying in the straits waiting for the ice to clear to come in here and take all the deer back to Siberia. Mathis reported one fawn born.

June 10, 1895.—Calm and foggy. Taootuk, Elektoona, and Ahlak went to the herd. Kjellmann went to Point Jackson to get some material for his boat. Mathis and Ahlak went to the old corral to plant turnips and rutabaga seed.

June 11, 1895.—Light west wind; overcast. Taootuk came home late last night very sick. Ahlook and Mathis came home to-day.

June 12, 1895.—Light west wind; cloudy, with thick fog on the hills. At 8.30 p. m. it snowed some. Thorwald Kjellmann has commenced a boat for his own use. Taootuk is a little better.

June 13, 1895.—Cloudy in the forenoon, with light west wind; clearing up at noon, with northerly wind; a light frost in the evening.

June 14, 1895.—Clear until 4 p. m., when it clouded over, with a light east wind. Frederick and Aslak were sent out looking for the two stray deer. Moses painted the little *Bear* (whaleboat).

June 15, 1895.—Overcast until 6 p. m., when a strong north-northeast wind commenced to blow. The flag halyard was put in order, and Moses smeared some paint on the roof of the house. Aslak and Frederick have not returned yet.

June 16, 1895.—Clear and calm, a beautiful day; a strong northeast wind all night. The usual service and Sunday school. The net was set in an open space near shore in hopes that there was fish in the ocean.

June 17, 1895.—Cloudy and overcast, with a light west wind, turning to south in the evening; fog at times. A general cleaning up was indulged in. The movement of the ice is watched with eager eyes. Per and Ahlook came in late from the herd.

June 18, 1895.—Strong west wind all night and day, with fog, snow, and sleet in the afternoon. The ice had been packed up on this shore during the night. Per, Ahlook, and Frederick went out to the herd. Berit, Johann's little daughter, is getting stiff in the arms and feet. The new boat was launched to-day.

June 19, 1895.—Clear in the forenoon; fog in the afternoon, with a chilly west wind.

June 20, 1895.—Clear in the morning, followed by a cold fog from the sea, with light northwest wind. Wocksock shot a seal outside the station. Mrs. Kjellmann is sick with a severe cold.

June 21, 1895.—Overcast in the morning, clearing up about noon.

Light west wind, becoming northeast and strong after 6 p. m., taking the ice from the shore. Kjellmann, Johann, Mikkel, and Mathis went out to Arkmore River to fish for trout.

June 22, 1895.—Clear and bright, with a light west wind in the afternoon; the sun set at 10.50 p. m. and appeared again at 1.50 a. m. (My watch must be twenty minutes fast.) Kjellmann and party returned at 7 this morning with considerable smelt. Martin, Elektoona, and Sekeoglook came in from the herd at 1 a. m. Grantley Harbor and the north half of the bay is now free from ice.

June 23, 1895.—Clear and nice in the early morning, with fog and light west-northwest wind all day. The ice is coming back in small cakes. No service, but Sunday school.

June 24, 1895.—Light west wind, with foggy weather; a clear spell in the afternoon. Frederick, Taootuk, Sekeoglook, Martin, and Elektoona went up to the herd in the canoe. Wocksock, Kummuk, and Sekeoglook each shot a seal to-night. The bay is filled with floating ice.

June 25, 1895.—Clear and calm, with very nice weather. Considerable codfish was caught last night and is being strung to-day. The ice is meandering around the bay with the tide.

June 26, 1895.—Clear and calm; a beautiful day, clouding in the evening. At 5 a. m. some natives came and reported "Umeakburk;" two steamers were nearing the anchorage. A sail was seen toward Kings Island, and during the day two more steamers arrived. Several barrels of tomcod were caught in one draw of the seine last night.

June 27, 1895.—Rain all night; cloudy, with west-southwest, south to southeast wind. At noon I took the whaleboat and five natives and went over to the ships and called on the whalers *Orca* and *Karluk*, arriving at the station at 1 a. m. (28th). I got some papers from the *Orca*.

June 28, 1895.—Cloudy, with a little rain; strong south to southwest wind. One steamer had anchored during the night. Samuel, Oowkitkoon, and Ahlook went out to the herd.

June 29, 1895.—Clear, cloudy, warm, cold, windy, calm, sunshine, foggy, and a little rain. Per and Martin came in from the herd. The natives are congregating on the beach again and preparing for the fishing season.

June 30, 1895.—Clear, with west-southwest wind, clouding over at sunset. The usual service and Sunday school. The steamer *Jeannie* arrived at the anchorage at 8 p. m. A boat's crew from the *Jeannette* is encamped on shore, fishing.

APPENDIX G.

METEOROLOGY AT TELLER REINDEER STATION.

Date.	Temperature.		Wind.		Remarks.
	A. M.	P. M.	Course.	Force.	
1894.	°	°			
Oct. 15	.....	20	.....	Calm	Clear, nice day.
16	19	23	E	Strong	Overcast.
17	23	42	E	Gentle	Clear, nice.
18	25	38	E	do	Do.
19	26	40	N	Zephyr	Do.
20	22	29	.....	Calm	Cloudy, with snow flurries.
21	25	40	.....	do	Clear.
22	19	33	.....	do	Do.
23	10	30	.....	do	Do.
24	12	26	.....	do	Do.
25	10	22	SE. to SW	Medium	Cloudy, gloomy day.
26	10	20	NE	Light	Clear.
27	6	18	SE	do	Cloudy, snow flurries.
28	8	16	W	Very light	Do.
29	0	2	.....	Calm	Clear and cold.
30	— 2	12	.....	do	Partly overcast.
31	8	20	NE	Strong	Cloudy, snowing in afternoon.
Nov. 1	14	30	.....	Calm	Clear, very fine day.
2	0	8	E	Strong	Clear.
3	8	28	E	Light	Do.
4	0	8	E	Very light	Do.
5	— 2	2	E	Calm	Do.
6	— 2	2	.....	do	Do.
7	10	20	NE	Light	Overcast.
8	10	22	N	Strong	Cloudy.
9	10	10	N	do	A full-fledged snowstorm.
10	10	10	N	Gale	Snowstorm.
11	9	9	N	Strong	Cloudy.
12	10	16	NW	Light	Cloudy, snow flurries.
13	9	21	SW., W., NW	do	Cloudy, some snow.
14	20	31	SW. to NW	do	Do.
15	18	2	NE., E., SE	Strong	Clear.
16	0	0	NE	Gale	Clear, snow drifting.
17	—12	— 2	NE	Strong	Cloudy.
18	— 8	— 4	SE	Light	Clear.
19	— 8	22	SE., N	Light forenoon; strong afternoon.	Do.
20	—12	20	N	Strong	Clear, with cold mist in evening.
21	— 2	12	NW	Strong gale in the night.	Cloudy, snow flurries.
22	— 4	— 2	N	Medium	Clear.
23	—12	— 2	NE	Light	Cloudy.
24	18	22	SSE	Gale	Snowing.
25	28	24	SW., SE	Very strong	Clear morning, becoming cloudy.
26	22	26	SE	Strong	Cloudy.
27	0	0	Continually changing		Clear.
28	0	0	E	Strong	Cloudy, snow flurries.
29	18	26	NE	do	Clear.
30	15	25	.....	Calm	Cloudy.
Dec. 1	14	22	E	Light	Cloudy, some snow.
2	12	2	N	Strong	Partly overcast.
3	4	10	NW	do	Raw mist.
4	— 6	—11	NW	do	Cold, blustering day
5	— 8	—12	NW	do	Cloudy.
6	— 9	—18	.....	Calm	Clear, cold.
7	—22	—21	.....	do	Do.
8	—23	—18	.....	do	Do.
9	—26	—17	.....	do	Do.
10	—20	—17	.....	do	Do.
11	—14	—21	.....	do	Do.
12	—14	—20	NW	Light	Do.
13	—13	—18	.....	Calm	Clear, hazy.
14	—14	—25	N	Light forenoon; gale afternoon.	Clear, snow flying in afternoon.

METEOROLOGY AT TELLER REINDEER STATION—Continued.

Date.	Temperature.		Wind.		Remarks.
	A. M.	P. M.	Course.	Force.	
1894.	°	°			
Dec. 15	—20	—20	E	Light	Clear.
16	—14	2	E	Gale	Snowing and drifting in afternoon.
17	— 8	—14	W	Medium	Clear.
18	—14	—18		Calm	Do.
19	—14	30	NE., S	Very strong	Stormy, snowing in the evening.
20	+22	18	SW	Light	A nice day, with a little snow in the evening.
21	18	— 2		Calm	Clear and pleasant; sun rose 11.40 a. m., set 2.50 p. m.
22	— 6	10	SE	Light	Cloudy.
23			SW., NE., SE	do	Cloudy, with some snow.
24	26	30	NE	Very light	Clear and pleasant.
25	30	31	S., SW	Gale in evening	Cloudy, with rain and sleet in evening
26	10	21	NE	In gusts	Cloudy, with snow flying.
27	20	28	NE	Very strong	Cloudy, with sleet.
28	24	30	NE	do	Cloudy, snow in evening.
29	—19	—23		Calm	Cloudy and raw, clearing up after dark.
30	10	14		do	Clear, nice, and pleasant.
31	2	4		do	Clear, very nice.
1895.					
Jan. 1	— 2	10		do	Clear, bright, and sunny.
2	— 4	2		do	Do.
3	— 6	4	NE	Light	Do.
4	9	16		Calm	Foggy.
5	— 5	8		do	Clear.
6	— 2	8		do	Foggy.
7	—11	— 2		do	Clear.
8	— 9	2		do	Foggy.
9	— 3	0	NNE	Medium	Clear.
10	—15	3	N	do	Clear afternoon, overcast forenoon.
11	—17	—22	N	Strong	Partly overcast.
12	—23	—29	NW	do	Stormy.
13	—24	—30	NW	do	Clearing after dark.
14	—31	—33	NE., E., SE	Light	Clear.
15	—15	—15	SE	do	Cloudy.
16	— 6	0		Calm	Cloudy, with snow flurries; two hours sunshine.
17	— 9	—19		do	Clear.
18	—19	—16	SE	Light	Do.
19	—18	—14	SE	do	Cloudy.
20	10	14	SE	Strong	Cloudy, some snow.
21	22	28	SE	Gale	Snow and sleet.
22	14	26		Calm	Overcast, clearing toward dark.
23	0	4		do	Clear.
24	4	— 3	N	Calm forenoon; strong afternoon.	Do.
25	— 2	6	NNE	Strong	Do.
26	10	15	NNE	Gale	Snow falling and flying.
27	16	22	NNE	Very strong	Blizzard.
28	4	4	NNE	do	Stormy and drifting.
29	4	0	NNE	do	Do.
30	— 5	— 2	NNE	do	Do.
Feb. 1	— 4	—10	NNE	do	Snow drifting.
2	— 4	2	NNE	do	Do.
3	5	—10		Calm	Clear and bright.
4	— 3	2	NNE	Strong	Partly overcast.
5	— 4	—10	N	do	Do.
6	—18	—14	N	do	Stormy and overcast.
7	—22	—23	NNW	Gale	Blizzard.
8	—24	—20	N	Strong	Snow flying some.
9	—26	—20		Calm	Clear and bright.
10	—16	—18	NNE	Gale	South side of house entirely blockaded.
11	— 2	12	NNE	Very strong	Snow flying.
12	—24	16		Calm	Overcast.
13	20	14		do	Clear, very nice day.
14	—10	4	N	Strong	Clear.
15	0	— 2	N	do	Snow flying.
16	— 2	— 8	NNE	do	Clear, with a little snow flying.
17	— 6	— 8	N	Very strong	Clear.
18	—18	—14	N	Gale	Cloudy. A shock of earthquake at 5 p. m.
19	—16	—14	NNE	Calm	Clear.
20	—20	— 6	NNE., ESE	Light	Do.
21	20	24	SE	do	Do.
22	12	3	NNE	Strong	Cloudy, with snow flying.
23	— 8	0	NNE	do	Snow flying.

METEOROLOGY AT TELLER REINDEER STATION—Continued.

Date.	Temperature.		Wind.		Remarks.
	A. M.	P. M.	Course.	Force.	
1895.	°	°			
Feb. 24	—18	—19	NNE	Strong	Snow drifting.
25	—20	—16	NNE	do	Clear.
26	—20	—22	N	Light	Do.
27	—24	—15		Calm	Do.
28	—21	— 6	N	Light	Overcast.
Mar. 1	—14	20	E	Strong	Do.
2	22	33	E	do	Clear forenoon.
3	10	25		do	
4	25	25	S., N	Medium	Clear part of the day, some snow.
5	25	33	SE. to S	do	Rain in the night, snow and sleet today.
6	10	25	E., SE., SW	do	Cloudy.
7	25	25	SSW	do	Cloudy, some snow.
8	10	26		Calm	Clear, very pleasant.
9	12	22	NNE	Very strong	Clear and nice.
10	—10	—15	N	do	Stormy.
11	0	18	NE	Strong	A little snow.
12	10	18	NE	Gale	Snow flying.
13	12	20	NE	Strong	Overcast.
14	5	12	N	Medium	Overcast, snow drifting.
15	0	12	NE	do	Partly overcast.
16	2	22	NE., ESE., N., NEE.	At times strong	Cloudy.
17	—10	—15	Changing	At times calm	Partly overcast.
18	—20	—12	NNE	Medium	Strong.
19	— 3	4	NNE	do	Clear.
20	—11	2	NNE	Strong	Do.
21	—12	— 4	NNE	Very strong	Do.
22	—21	10	NNE	Strong	Do.
23	—22	—14	NNE	Very strong	Do.
24	—19	— 8	E	Very light	Do.
25	—18	— 6	SE, NE	Light forenoon; strong evening.	Stormy toward night.
26	—10	— 2	NNE	Strong	Clear.
27	—11	— 6	NNE	Medium	Do.
28	—17	—10	N	Light	Do.
29	—22	—12	NNE	Very strong	Clear, snow flying.
30	—22	— 8	NW., NNE	do	Overcast, snow flurries.
31	—12	0	NNE	Medium	Clear in the middle of the day.
Apr. 1	—12	0		Calm	Overcast morning and evening.
2	—12	— 4	NW	Medium	Partly overcast.
3	—12	4	N	Light	Clear.
4	—12	4	Changing	do	Do.
5	— 4	10		Calm	Do.
6	0	4	SE	Light	Very fine.
7	— 2	18	SE., E	do	Clear, cloudy in evening.
8	—16	—14	SE	Strong	Foggy, clearing and nice.
9	— 2	20		Calm	Clear and bright.
10	6	25		do	Snow falling and overcast.
11	8	28		do	Overcast.
12	4	10	NNE	Strong	Stormy, some snow.
13	0	0	N	do	Snow dancing.
14	— 4	4	N	Medium	Snow going south.
15	— 4	15	N	do	Clear.
16	—10	2	NNE	do	Snow flying.
17	10	16		Calm	Clear.
18	8	10	E. in afternoon	Medium	Do.
19	8	15		Calm	Do.
20	12	16		do	Do.
21	8	20	E	Very light	Calm forenoon.
22	8	15		Calm	A little snow.
23	10	25	S	Strong	Snowstorm.
24	20	28	SSW	do	Storm, snow, and fog.
25	18	30	SSW., N	do	Some snow.
26	18	30		Calm	Clear.
27	25	25	NE	Light	Cloudy, with some snow.
28	20	10	NNE	do	Clear in morning.
29	4	12	NNE	Gale	Snow flying.
30	8	20	NNE	Light	Clear and bright.
May 1	12	28	NW	do	Do.
2	12	30		Calm	Clear.
3	10	31	SSE	Light	Do.
4	12	32	SSE., ENE	do	Do.
5	15	35	NNE	Strong	Do.
6	15	35	NNE., N	do	Partly overcast.
7	20	33	NNW., NNE	Medium	Overcast.
8	20	36	S., NE	Light	Clear.
9	20	30	NE	do	Do.

METEOROLOGY AT TELLER REINDEER STATION—Continued.

Date.	Temperature.		Wind.		Remarks.
	A. M.	P. M.	Course.	Force.	
1895.	°	°			
May 10	22	29	NNE	Light	Clear.
11	18	31		Calm	Overcast, fog in mountains.
12	20	35	N	Strong	Clear, some snow flying.
13	25	36	N	Light, rising	Clear.
14	14	33	NE	Rising	Calm forenoon, clear.
15	18	36		Calm	Clear.
16	18	35		do	Do.
17	19	31	NNE	Medium	Overcast part of the day.
18	18	30	NNE	do	Overcast.
19	23	40		Calm	Do.
20	42	42	S	Light	Cloudy.
21	34	40	SE., NNE	do	Rain part of the day.
22	45	45	SE	do	Cloudy.
23	45	45	SE	do	Do.
24	.....	51	S., N	do	Clear.
25	.....	50		Calm	Do.
26	.....	41	N. in evening	do	Cloudy night.
27	30	42	NW	Light	Clear.
28	.....	45	NE	Strong	Do.
29	.....	52	N	Light	Do.
30	.....	52	N	Very light	Do.
31	.....	54		Calm	Do.

APPENDIX H.

ACTION OF THE NATIONAL EDUCATION ASSOCIATION.

The National Education Association (representing the 400,000 public school teachers of the United States), in session at Denver, Colo., July 9 to 12, 1895, passed the following resolution:

Resolved, That we heartily approve the efforts to educate Alaskans, and especially in the care and use of reindeer as an industry and as a means of saving them from starvation and affording them food, raiment, shelter, and transportation; and that we believe Congress should extend to Alaska aid in settling the questions of productive industry by experiment stations, as it now aids in the other Territories and and in the several States by its appropriations for agricultural stations.

ACTION OF THE LAKE MOHONK CONFERENCE.

At the thirteenth annual meeting of the Lake Mohonk Conference, October 9 to 11, 1895, the following action was taken:

We note with satisfaction that the experiment of introducing reindeer into Alaska has proved a marked success. But the supply of reindeer is as yet totally inadequate for the needs of the natives. The sum hitherto appropriated has been but $7,500 a year, sufficient only to purchase 150 reindeer and pay the expenses of the herders. We therefore earnestly second the request of Commissioner Harris that the appropriation be increased and that Congress set aside for this coming year for the purchase and maintenance of reindeer the sum of $20,000.

Resolved, That we specially commend the work of the field matrons as productive of the best good of the Indian communities, through the instruction and elevation of the Indian women, and in that respect particularly necessary. We urge substantial additions to the appropriation for their support and that their number may be largely increased.

ACTION OF THE BOARD OF INDIAN COMMISSIONERS.

The following resolution was adopted at the conference of the Board of Indian Commissioners and the friends of the Indians in session at Washington, D. C., January 15, 1896:

Resolved, That this conference most earnestly urges upon Congress larger appropriations for education in Alaska and for the more rapid introduction of domestic reindeer in that region.

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APPENDIX.[1]

By DAVID STARR JORDAN and GEORGE ARCHIBALD CLARK.

The report of Mr. Henry W. Elliott on the Seal Islands of Alaska, first published in full in connection with the United States Census of 1880, is the basis of our first broad knowledge of the habits and life history of the fur seal. The work is comprehensive in its conception, vivid in its presentation, and, considering the difficulties of the undertaking, generally speaking, accurate in its conclusions.

To criticise that part of the work which in the light of later investigations seems erroneous is an ungracious task. It is, however, one which can not be avoided, in view of the part Mr. Elliott's numerical calculations have had in the subsequent history of the fur-seal herd and in view of the republication of the work now at practically the same time with the more complete results of the investigations of 1896 and 1897.

That the first investigator of this difficult subject should have committed errors, or that he should not have looked at all phases of the subject, can not be surprising. Whoever does real work must make mistakes, and Mr. Elliott has been no exception. At the same time the present writers wish to put on record their respect for the energy, ingenuity, and faithfulness with which Mr. Elliott has performed the labor of love of making known the history of the fur seal.

Page 7: It is to be doubted whether a fur-seal rookery, at least of the Alaska species (*Callorhinus alascanus*), ever existed on the Farallones. On the Mexican island of Guadalupe a considerable rookery of a distinct species of fur seal, recently described by Dr. Merriam under the name of *Arctocephalus townsendi*, existed until about 1885, and there is reason to believe that a few animals still remain in that neighborhood.

Besides the little rookery on Robben (not Robbins) Reef, or Tiuleni Island, considerable rookeries existed on the Japanese Kuril islands—Srednoi, Raikoke, Musir, and Broughton. These herds are not yet wholly extinct.

Page 16: It is not true that blue foxes are restricted to St. Paul and St. George islands. They are native also to the Commander Islands, and were found upon the Aleutian Islands at the time of their discovery, in 1741. They are reported to have existed in the vicinity of the mouth of the Yukon and on the Siberian Coast. A fuller account of the distribution of the blue fox will be found in Petroff's report on the resources of Alaska, vol. 4 of this series, page 890. The contrary statement that they were introduced on the Pribilof Islands by the Alaska Commercial Company is without foundation. By reference to the sum-

[1] Prepared at the request of the Secretary of the Treasury. See prefatory note to Volume I.

mary of furs purchased by Russian-American traders, given in Petroff's report, mentioned above (pp. 895–899), we find that these foxes have been taken on the Pribilof Islands since 1842.

It is certainly not true at the present time that the foxes "feed and grow fat on sick and weakly seals, also devouring many pups." It is probable that they eat the dead pups late in the season which have starved. On St. George Island in 1896 practically all such pups were eaten up. It may be that they also occasionally attack a starving pup, but the number of healthy, vigorous pups injured by them must be small.

Page 19: There is no special scarcity of fishes about the Pribilof Islands as compared with other islands in Bering Sea. Apparently the seals rarely, if ever, feed near the islands.

Page 23. "Holluschickie" seems to us an undesirable spelling of the Russian word "holostiaki," the plural of "holustiak," the bachelor seal.

Page 37: The statement that "there is no need of protecting the fur-bearing animals (elsewhere than on the seal islands), unless it be by a few wholesome general restrictions in regard to the sea-otter chase," needs some qualification in the light of subsequent events. "The rugged, forbidding, and inhospitable exterior" of Alaska is no bar to the skin hunter, any more than is the rough and tempestuous waters of Bering Sea to the pelagic sealer.

Page 39: The reasons for leasing the right to take skins to a responsible company are well stated by Mr. Elliott, and his statements have now a historic value as representing the view at that time. It is difficult, however, to understand why in case the Government undertook to sell the skins on its own account to the highest bidder the sale should be conducted on the islands rather than at San Francisco, for example. But even if it did involve the licensing of "a thousand ships to be present at the sale," the statement which follows, that "the rattling of their anchor chains and the scraping of their keels on the beaches of the two islands would alone drive every seal away and over to the Russian grounds in a remarkably short space of time," is clearly absurd. The notion that the Pribilof seals might in some way or other be driven to the Commander Islands or to Japan has arisen every year from 1868 to 1897, and it never had a particle of justification.

Page 43: The differences between the fur seal, or "sea bear," and the true or hair seal noticed by Mr. Elliott are great and fundamental. Except that they are both pelagic carnivora, feeding on fish, the two animals have scarcely anything in common.

Page 47: "Sikatch" is preferable to "See Catch." Mr. Elliott spells Russian names according to their English pronunciation instead of following the accepted method of transliteration.

We have every reason to believe that the bull returns each year to his former stand as a matter of preference. He goes elsewhere if he can do better or if he is forced to do worse. With the females and young males the place of return is doubtless less definite, though in the case of the adult cows, at least, preference has evidently to do largely with choice of location.

Page 48: The fighting among the bulls here referred to as going on "morning, noon, and night without cessation" is greatly exaggerated. A certain amount of "bluffing" is constantly to be seen on the rookeries, but real fighting is not very conspicuous. According to the observations of the season of 1897 there is very little fighting before the cows begin to arrive, and these straggle in so slowly and quietly at first as to attract little attention from the bulls. The real fighting occurs at

the height of the season, when the coming and going of the cows in large numbers keep the harems stirred up. At this time, taking advantage of the confusion, the idle bulls attempt to steal cows, and fighting results between this class and the harem masters. The harem bulls rarely fight among themselves, though they are ready at all times to combine and make common cause against an intruder. The fiercest fighting is among the idle bulls, which hang about the rear of the rookeries. It is among this class that the fatal fights occur.

Page 53: The harem masters, while tired, lean, and hungry on leaving the rookeries at the close of July, are hardly as abject as Mr. Elliott's graphic words would leave one to infer. They are able and willing to fight intruders to the last, as our efforts to remove them in making the count of live and dead pups July 30 to August 3, 1897, abundantly show.

While it is true that for the most part the rutting season is over by the 10th of August, it is not entirely so, as our observations showed frequent instances of copulation throughout August and even in September.

Page 54: The fur seal certainly does not swallow "occasional juicy fronds of seaweed or kelp," nor even "soft-shelled crabs" to vary the monotony of his diet. None of the many stomachs examined during the seasons of 1896 and 1897 show traces of these things. Such objects if taken into the stomach at all are more likely seized by accident rather than intent. It is difficult to say what the purpose of the fur seal and the sea lion may be in taking the stones into the stomach, but this practice is not, as here stated, limited to the bulls. It is common to all classes of the animals down to the pup of three months old.

That the stomachs of the bachelors are empty, as here mentioned, is not due to fasting on the part of this class of animals, but rather to the fact that they in common with the cows remain in the water to digest their food. The examination of a considerable number of cows during the season of 1896, evidently just returned from feeding, showed the stomachs in every instance to be empty, not excepting an instance where the animal came to its death by choking on a fish bone.

We have here a reiteration of the exaggerated account of fighting already referred to. The appearance of the bulls, as seen this season just before the arrival of the cows, plainly indicated that no considerable fighting had taken place. There were none of the wounds visible which were so conspicuous among some classes later. The "period of universal, spasmodic, desperate fighting" among the bulls from the 12th to the 14th of June is a pure fiction. The arrival of cows about this time is so gradual and quiet that the bulls, as a class, pay no attention to them and there is absolutely no fighting over them. The record of daily counts show this gradual appearance of the cows. On Kitovi rookery, where 2 cows arrived on June 14, there were but 9 on the 20th and 76 on the 26th, out of a total for the season of 1,245. A similar count on Lukanin showed like results, there being 1 cow on the 12th, 37 on the 20th, 207 on the 26th, out of a total for the season of about 4,000. During this period there was absolutely no disturbance on the rookeries.

It may be contended that in the more expanded and crowded condition of the rookeries, as seen by Mr. Elliott, a different order of things obtained. This may be true, though it is very doubtful, while the present grossly overstocked condition of the rookeries as to bulls, and the consequent fiercer struggle to obtain possession of the few remaining cows, make it probable that more fighting, on the whole, occurred in the seasons of 1896 and 1897 than ever before. There are and have

always been sanguinary battles on the rookeries, but they have been greatly exaggerated.

The "exceeding peace and dove-like amiability" of the cows and the "attractive, gentle, and intelligent" expression on the following page are relative matters. While the cows do not indulge in pitched battles they are snappish creatures, uncivil to each other, cruel to pups not their own, and capable of giving their lords much well-deserved nagging.

Page 56: The very elaborate and complex method of rookery organization, the selection of their breeding grounds with the "skill of civil engineers," the "amiable nature" of the females and the "intelligent courage" of the males dwelt upon by Mr. Elliott in his vivid description of these animals presupposes a degree of intelligence which the fur seal does not possess. The fur seal has wonderfully developed instincts, but its intelligence (that is, its voluntary or adaptive activity) is relatively low.

In our preliminary report for 1896 we say: "From the ruthless natural destruction of all seals in which the geographical instinct or the instincts of feeding and reproduction are defective, results the extreme perfection of the few instincts which the animal possesses. The life processes of the fur seal are as perfect as clock work, but its grade of intelligence is low. Its range of choice in action is very slight. It is a wonderful automaton and the stress of its migrations will always keep it so.

"By intellect or intelligence in this sense is meant the power to choose among possible different courses of action. The external influences and internal impulses produce certain impressions on the nervous system of the animal. By the automatic instinct the response which follows is directly related to the cause, and there is no choice among responses—so much influence; so much rebound. By the operations of instinct each individual in given conditions will act just as any other individual will. Intellect, however, implies individuality. One animal will choose to do this, another that, adapting action to its special needs or circumstances. A fur seal will do what its ancestors have had to do to perfection. If it is led to do other things, it is dazed and stupid." (Jordan, Prel. Rep., 1896, p. 27.)

Page 56: There is no normal or regular size of the harem. It ranges from 1 to an indefinite number, 75 and even 100 being counted in exceptional instances. The average at present, with a vast surplus of bulls, is between 29 and 35, and it has probably never varied far from this. The harems, however, appear smaller when counted, because at no time are more than half the cows present at once. The cows are extremely gregarious and crowd closely together on the preferred grounds near the shore. The shrinkage of the rookeries shows itself in the progressive abandonment of outlying bulls, those in the preferred districts having about as many cows in one year as another.

Page 58: The wounds of the fur seal, it is true, heal very rapidly, but not without a scar. There are few adult bulls on the islands that do not show a distinct scar at the angle of the fore flipper, a coveted point of attack in fighting. The bachelors are frequently bitten by bulls who have been shut out from the rookeries by their betters and are occasionally included in the drives. On the killing grounds numerous animals are rejected because of a welt or seam in the skin, the result of an imperfectly healed wound.

Page 59: The weight of the pup at birth is not, as here stated, "3 to 4 pounds," and its "length 12 to 14 inches." The actual weight is from

11 to 12 pounds and the length from 18 to 24 inches. On page 274 Mr. Elliott gives the weight of the fur-seal pup of one day old as 5 to 7½ pounds and its length as 12 to 13 inches. In the length of the tail of the fur seals given on the preceding page that of the adult male is said to be 4 to 5 inches. In all our measurements the tail of the bull did not exceed 2 to 2½ inches. These are small matters, but they point to guesswork rather actual investigation as a source of information and have an importance in connection with larger mathematical problems, with the results of which we must take decided issue later on.

The apathy here noted as shown by the mother seal is true after the pup has become able to move about and care for itself. For two or three days, however, the mother seal is greatly concerned for the welfare of her pup. She will lift it out of the way of a trampling bull as a cat would a kitten. She will not desert her newly born pup. After a few days, however, she correctly infers that it can take care of itself and only looks after it at meal time, though she apparently enjoys having it sleep at her side.

Page 60: Probably Mr. Elliott's estimate that not more than 1 per cent of the pups are crushed by the bulls is too low. Two or 3 per cent would probably be nearer the truth. On the other hand, in our preliminary report for 1896, we were in error in ascribing the greater part of the early mortality of pups to trampling by bulls. Most of the natural deaths of young pups, occurring from July 20 to August 20, are due to the attacks of a small parasitic worm (*Uncinaria*), which lives in infected or filthy sandy areas. The larvæ adhere to the fur of the mother and are swallowed by the pup while nursing. The worm develops in the small intestine, where it multiplies, sucking the blood of the pup, which may die of weakness or anæmia even when quite fat. The ravages of the worm are practically over by the end of August.

Unfortunately Mr. Elliott records no observations of the rookery grounds in August, and gives us no data by which the ravages of the worm can be estimated for the years when the rookeries were at their height. Our first records of its work are found in a photograph of Tolstoi sand flat taken in 1891, when several thousand pups, unquestionably killed by the worm, were found there, and are shown in a photograph taken by Dr. Dawson. On this same rookery the presence of innumerable bones of pups strewn over territory unocupied even in 1891 shows that the worm was at work prior to that date. It is probable that the ravages of the *Uncinaria* are as old as the herd itself.

The reference in the footnote accompanying this page to the effect of the "sudden nip" of the surf as a cause of death among the pups is apparently unwarranted. The close observations of the past two seasons, and particularly of the season of 1896, covering the severe storms of September and October, failed to disclose any casualties due to the surf. The number of drowned pups found among the dead is insignificant, and the evidence points to imprisonment among the rocks, weakness from hunger, or the attacks of the worm as the indirect causes of the few deaths which are due to drowning. The windrows of dead pups cast up by the surf at Tolstoi and Vostochni are not drowned pups, but wormy ones washed from the rookeries by the surf.

Page 61: The observations of the season of 1897 show conclusively that the pup knows its mother's voice, even at the age of two days, and can follow it unerringly. That the pup "noses around every mother seal that comes in contact with them" does not prove the inability of the pup to recognize its own mother. The persistent and successful

efforts of a pup less than two days old to follow its mother's voice through a distance of 100 feet of rocky beach to a point whither she had been carried by an idle bull is abundant proof of its ability.

Page 62: Mr. Elliott here discusses the possible appearance of epidemics or other specific diseases and finds no evidence of any; but unless he traversed the rookeries and examined them closely in August he could not have known anything of the mortality there to be found among the pups as well as the adult animals. An adequate notion of the real condition of the rookeries in this regard can be obtained only by driving off the animals and walking over the ground. Mr. Elliott evidently did not do this. The investigations of 1896, though very thorough, failed at once to understand the mischief due to *Uncinaria*, because no one of the investigators then knew anything of the creature itself. Its existence in 1872–1874 may therefore easily have been overlooked by Mr. Elliott.

Page 65: Our experience during the past two seasons regarding the keenness of the sense of smell among the seals does not bear out the statement here made by Mr. Elliott and which represents the current traditions of the islands. The odor of a man to the windward may possibly startle a drove of bachelors, some one of them first noticing it and by a rapid movement startling the others. In such case it is no more reasonable to ascribe the effect to the sense of smell than to the sense of hearing. Sounds are more distinctly conveyed also from the windward direction. It is also well known that sharp sounds startle the seals, and the clapping of the hands or the rattling of a stick on a rock is the usual means of urging on a drive. In our investigations we have found it possible to closely approach bachelors and cows from the windward by moving noiselessly and keeping out of sight, and have observed them for long periods at a time without disturbing them. We have also repeatedly passed to the windward of sleeping bachelors without disturbing them. Mr. Bristow Adams in 1897 painted white crosses on the backs of two bulls asleep on Tolstoi sands. But it is rarely the case that all members of a flock of seals are asleep at once, and if one animal catches sight of the intruder or hears his step, its movements will set the whole herd in motion. The vision of the fur seal as Mr. Elliott rightly states is imperfect and indistinct. As a result, any moving object fills it with alarm, especially if the object stand out against the sky line. In 1896 when seals were herded in the salt lagoon, a stake set up in the middle of a sand beach was sufficient to frighten away from it the seals endeavoring to escape and was quite as effective as a man would have been. Whatever may be the relative importance of the senses of the fur seal, it is not at all certain that the sense of smell is more acute than the others; and whatever may be its function, it certainly does not convey a sense of danger unless the object exciting it is in view of the animal.

Page 72: It is not true that yearling males and females are alike in size as in behavior and color. The females of one year old are notably smaller than the males of corresponding age—not much larger in September than the largest gray pups. The yearling male approximates the 2-year-old female in size. It is not true that "the 3-year-olds and the older cows look exactly alike as far as color goes." In general the young cows are more silvery and their whiskers darker than the older ones, while the pelage of the older females is darker than that of the young, particularly in the region of the throat.

Page 73: Here is still another estimate of the size of the fur-seal pup. In the first instance it was 3 to 4 pounds; now it is 6 to 7½, and subsequently it is given 5 to 7½ pounds.

Page 78: The statement here made by Mr. Elliott that prior to his labors "nothing to guide to a fair or even approximate estimate as to the number of fur seals on these islands" had been done, while true for the Russian period is certainly unjust to Capt. Charles Bryant, who in 1869 made an investigation of the condition of the herd and constructed an estimate of the number of seals, in our judgment, quite as correct as Mr. Elliott's. In the Bulletin of the Museum of Comparative Zoology, Cambridge, 1870, Vol. II, page 106, Captain Bryant makes the following statement:

"There are at least 12 miles of shore line on the island of St. Paul's occupied by the seals as breeding grounds, with an average width of 15 rods. There being about 20 seals to the square rod, gives 1,152,000 as the whole number of breeding males and females. Deducting one-tenth for males leaves 1,037,800 breeding females." A separate estimate on the same basis for St. George is made, giving one-half as many to that island. With this total of approximately 1,500,000 breeding females (not including the young) for the two islands, contrast the estimate of 3,193,000 "breeding seals and young" arrived at by Mr. Elliott.

Crude as Captain Bryant's estimate is, both as to methods and result, it is the pioneer work in the line of acreage enumerations of the seals, and as such should receive due credit. The work was done in 1869 and its results published in 1870, two years before Mr. Elliott began his investigations.

Page 78: The law of distribution stated by Mr. Elliott is relatively true, but can not be exactly so. It is physically impossible to stow as many seals on a slope covered with coarse rocks as in a basin-shaped area free from stones. As the herd declines, the harems become more and more separated, especially in rocky places, where the stations are not equally convenient. In other words, while in Mr. Elliott's time the rookeries were as solidly packed as the nature of the ground would permit, they are not crowded to the same extent in their present shrunken area. If there were in his day five times as many seals as now, it does not follow that the rookeries occupied five times the present space. As a matter of fact, they did not.

Page 79: The description of the period between July 10 and 20 is relatively true. To the eye of the casual observer there is little change in the appearance of the breeding grounds. But as a matter of fact at this time the greatest changes of the season are going on, the difference in population between one day and the next being anywhere from 10 to 30 per cent, as shown by actual counts made during the season of 1897. On a breeding area called the "Amphitheater," on Kitovi rookery, the following is the daily count of cows:

July 10	660	July 16	678
11	703	17	698
13	654	18	566
14	556	19	556
15	703	20	429

During this period there was a gradual increase of harems from 35 on the 10th to 46 on the 13th, and by the 25th there were 53. Corresponding to these changes in population there was a gradual and marked expansion of the territory occupied by the seals, due to the podding out of the pups and the scattering of the cows in following them.

From these investigations it will be seen that at the time when Mr. Elliott supposed the rookeries to be most stable they were in fact most unsettled. The maximum population instead of covering a definite period, represented at best a single day somewhere about the middle of July when the arrivals and departures practically balanced each other,

for even at their maximum not more than half of the cows actually belonging to a given rookery were present. Of this fact Mr. Elliott was not fully aware. Moreover he infers that the 2 year old cows are on the rookeries at this time, whereas they do not come on the rookeries until the rutting season for the adults is over, in the last week of July and the first of August. These two important matters must always be kept in mind in weighing the value of Mr. Elliott's estimate.

The surveys recently made upon the islands show clearly that Mr. Elliott's maps and surveys are only rough sketches. Captain Moser, as a result of his investigations in 1896, said that Mr. Elliott's shore line "rarely stood the test of an instrumental angle." If this be true of the fixed and definite sea margin, what must be the inference in the case of the changing and shifting boundaries of the rookeries? The statement that "there is no more difficulty in surveying these seal margins * * * than there is in drawing sights along and around the curbs of a stone fence surrounding a field" is by no means reassuring to one who has investigated the breeding grounds in the height of the season. A man can not approach within 50 to 100 feet of the line of breeding seals except at the risk of his life. He must therefore note his boundaries from a distance and make his measurements after the seals have left in the winter. The band of breeding seals is of every conceivable width, and to reach an average estimate of its area on all the rookeries would require thousands of measurements. But after the seals have left the ground the making of these measurements becomes a mere matter of guesswork, as no marks are left to show where the boundaries were. In view of the fact that Mr. Elliott gives us no more information about his surveys of the rookeries than the statement above quoted, we can not concede to them a greater value.

The unit of space here assigned to the individual seal must also be objected to. The statement that the female occupies a little less than 2 square feet is of course a slip of the pen or a misprint for 2 feet square. This Mr. Elliott has himself corrected in his 1890 report. But the 2 feet square or 4 square feet intended, in which it is assumed that the cow brings forth her young and spends her time on the rookery, is still far too small for the crowded areas, while in the rocky beaches it is perfectly absurd. The average animal is 4 feet long and measures 3½ feet from tip to tip of her outstretched foreflippers. Our observations show that on the most densely massed breeding grounds, where the cows are packed together as closely as they can be, they still require a space of from 8 to 12 square feet. But these massed areas are but a fraction of the whole ground. Mr. Elliott, in not allowing for the absence of at least one-half of the cows and in including the 2-year-olds, unintentionally reduces in large measure the error which would naturally result from the smallness of his unit of space. But even this only tends to add confusion to the estimate.

Page 85: As a concrete illustration of the unsatisfactory nature of Mr. Elliott's estimate, we may cite the proportion which it assigns to Kitovi and Lukanin rookeries. They are given a total of 335,000 breeding seals and young, or 160,000 adult breeding seals in round numbers, of which, according to his estimate (15 cows) of the average harem, about 10,000 are bulls. These rookeries have been carefully studied during the past two seasons, and we know exactly how many breeding families are on them at present. For Kitovi rookery we know absolutely by a count of pups the number of cows which belong to it; we can estimate closely for Lukanin, and as a result we find 318 breeding bulls and 9,300 cows. Mr. Elliott's figures would require us to believe

that in his day there were 31 times as many harems and 17 times as many cows on these two rookeries. This is impossible, and nothing in the appearance of the ground or the history of the herd would warrant such an assumption. Fortunately in the log of St. Paul Island we have evidence so nearly contemporaneous with Mr. Elliott's time as to represent practically identical conditions. On May 24, 1880, Mr. Beaman, then agent on St. Paul, records that by actual count there were on that date 275 bulls on these two rookeries. Not all the bulls, of course, could be expected on the rookeries at this date, but the season was a normal one, as the bulls began arriving on the 30th of April. We know from our experience of the past season that by the end of the first week in June practically all the regular harem masters are in their places. It is impossible for us to determine what proportion of the bulls would be present on the 24th of May, but we may reasonably infer that if there were to be 10,000 present by the 10th of June (when the cows begin to arrive), 275 was a ridiculously small proportion to be found on the 24th of May.

Page 93: In this recapitulation for St. Paul we find the now abandoned rookery of "Nah Spil" estimated at 8,000 breeding seals and young, or about 275 bulls and 3,500 cows. This was indeed a small rookery, about one-half the size of Kitovi to-day. It is to be regretted that Mr. Elliott did not make an actual count of its pups. In connection with this little rookery, however, we have the most conclusive evidence of the exaggerated nature of Mr. Elliott's estimate. In the year 1879 we find it recorded in the log of St. Paul Island that a total of 23 bulls were counted on this rookery on the 20th of June after a considerable number of cows had arrived. There can be no question that at that date all the harem bulls were in place.

This recapitulation also shows the most serious objection of all to Mr. Elliott's survey of the rookeries. Here we find that for 9 of the 12 breeding grounds of St. Paul, involving 7 miles of breeding shore line, each rookery is given an even average width of 150 feet. What the average should be we would not assume to say, but no one familiar with the character of these rookeries would concede them all to be of this average width. This average width is a matter of great importance, for an error in it is multiplied throughout the whole 7 miles of breeding grounds. Suppose the average width was in fact 160 or 140 instead of 150. This, according to Mr. Elliott's method of the calculation would require the adding to or subtracting of 184,000 animals from the total. It is impossible to accept the results of such an estimate as even approximating the facts.

Page 100: In his final summary of the rookeries of the two islands Mr. Elliott finds a total of 3,193,420 "breeding seals and young." This includes, according to his subsequent statement, all adult breeding bulls and cows, the virgin 2-year old cows, and the pups of the year. On page 102 he tells us that 1,000,000 of these were pups, and by his calculation in the same connection of the survival of 2-year olds we find that 225,000 of this class are included. For the million pups there must have been an equal number of breeding cows, or in all 2,225,000 cows and pups. The difference between this figure and 3,193,420, or 868,420, must have been breeding bulls. Mr. Elliott does not give an estimate of the breeding bulls in connection with this report, but in 1890 he tells us that there were 90,000 breeding bulls in 1872–1874. Mr. Elliott would not himself accept what his figures necessarily show. Such a proportion of breeding bulls could not have existed on the islands. These discrepancies and others show conclusively that Mr. Elliott's

figures are only guesses multiplied by assumptions, and his inexact use of them declares that he himself attached no greater value to them at the time they were made.

Page 101: Mr. Elliott's conclusion here stated as to the perfect safety of land killing is unquestionably correct, and should never have been questioned by anyone, least of all by himself, as is the case in his 1890 report.

Page 102: The Basking shark (*Cetorhinus*) never killed a fur seal nor any other large animal. Mr. Elliott also refers to the Nurse shark (*Somniosus*), which is probably equally innocuous so far as the fur seals are concerned.

The estimate that half the number of pups return as yearlings can not be far out of the way. At present the number returning as 3-year olds is not far from one-third of the number born.

Page 103: The course here described as taken by the seals in their migrations is misleading. They do not "spread themselves over the entire Pacific." That some of them probably become lost and wander about at distances remote from the track of the main herd is true, as the record of observations shows. But the herd as a whole takes a direct course through the Pacific Ocean obliquely to the coast of California. It is probable that the adult males go no farther south than the Gulf of Alaska, and that the young of the year get no farther south than the latitude of Cape Flattery; but the adult females are taken off the coast of southern California within two weeks after their departure from the islands, and hence their course must be direct and rapid. On their return they move slowly back along the American Coast, reaching the passes about the 1st of June, whither they have already been preceded by the adult males and older bachelors. The younger seals of both sexes arrive later, during the latter half of July.

The Commander Island herd passes down along the coast of Japan and returns on its track. There is no interchange between the two herds, which represent distinct species. As there is about 700 miles distance between them during the breeding season, so in the course of their migrations there is the entire breadth of the Pacific Ocean between them.

Page 104: There is no real meaning to the statement that the "aggregate of four and five millions of fur seals, as we see them every season on the Pribilof Islands," represents "the maximum limit of increase assigned to them by natural law. The great equilibrium which nature holds in life upon this earth must be sustained at St. Paul as elsewhere."

This law of equilibrium, reduced to plain language, is simply this: When the annual death rate of a species equals its annual increase its numbers cease to multiply. That the herd actually came to a condition of equilibrium seems to be a fact. This implies a vast destruction of pups, proportionally greater than that which now obtains. The ravages of *Uncinaria* were probably the determining check, and the losses it caused sufficed to hold the herd in equilibrium. When to this great natural loss was added the waste of pelagic sealing, the rapid decline of the herd was inevitable.

Page 104: The statement that whole windrows of cod and wolf-fish heads bitten off at the nape were washed up on St. George in 1873 is apocryphal. Neither cod nor wolf-fish bones have yet been found in the stomach of the fur seal. The fishes in question live on the bottom, in general beyond the reach of these animals, and do not swim in schools.

The estimate here given of the amount of fish consumed by the fur

seal has no value, being based wholly upon assumptions. It is certain that the fish life of Bering Sea is in no appreciable way affected by the feeding of the seals.

Page 105: It is absurd to say that "an adequate realization by ichthyologists and fishermen as to what havoc the fur-seal hosts are annually making among the cod, herring, and salmon of the Northwest Coast and Alaska would disconcert and astound them. In Bering Sea the fur seal feeds almost exclusively on pollock, seal fish, and squid. None of these are used as food by man. The seal fish, a small surface-swimming smelt, has never yet been taken by man, all our knowledge of it being drawn from skeletons found in the stomach of fur seals. Other species are occasionally eaten, and as the fur seals go up the coast they capture salmon, herring, and rockfish, but not enough to affect in any tangible way the fisheries. There are no fishing banks in the North Pacific south of the Aleutian Islands, nor do our fur seals invade the Japanese side of the ocean.

It is not likely that the fur seals feed upon crustaceans at all. By "tender algoid sprouts" we suppose the author means the tunicates which are attached to the roots of large algæ. They are small marine animals from 1 to 2 inches in diameter, of leathery substances and hollow within. But neither tunicates nor algæ are food for the fur seals, young or old.

Page 108: In making this statement regarding the "impossibility of human management to promote" the increase of seal life, Mr. Elliott was not aware of the large natural loss on the rookeries among the pups due to the parasitic worm *Uncinaria* and to trampling. Both these losses are considerable and are directly related to defective rookery conditions, which are, to a limited extent at least, within the control of man. With the sandy and flat areas broken up or covered with rocks, this loss must be greatly reduced and, consequently, the increase of the herd augmented.

Page 109: Unfortunately, the stakes and marks here stated to have been set up to show the surveys of Mr. Elliott are not to be found. Had such permanent marks been left they would to-day furnish much needed light on the early condition of the rookeries.

Page 112: We have here another illustration of the loose use Mr. Elliott makes of figures. He now states the population of fur seals, "male and female," at 2,500,000 to 3,000,000. On page 108 it was between 4,000,000 and 5,000,000, which agrees with his completed census—4,700,000. In our judgment this latest estimate is very near the truth, though unintentionally so. It would, however, be of no more value than the others did it not correspond better to the known history of the herd. We cite it here simply to show the erratic way in which Mr. Elliott uses figures.

Page 112: The statement here made "that the fur seal can not breed, or rest, for that matter, on any other land than that now resorted to which lies within our boundary lines" is an extreme one, and rests solely upon individual opinion. There are many islands of the Aleutian chain which doubtless furnish, in shore and climatic conditions, equally suitable breeding grounds. But these and all other islands than the Pribilof, Commander, and Kuril islands were known to primitive man, and this fact probably prevented their becoming breeding grounds for the fur seal. The habit of resort to the islands once formed it was too strong even for the presence of man to affect. In fact, no operation of man can be said to have attracted the attention of the animals at all. All the operations of their lives go on just as if they had never seen man.

Page 113: It is not plain to what rookeries Mr. Elliott here refers as to the northward and westward and which had not in 1880 or for ten years previously been noticed by the sealers. From the detailed list of killings (Vol. II, p. 258 ff.) during these years it will be seen that all the regular hauling grounds of all the rookeries were driven from without exception.

Page 139: Our observations for the season of 1897 do not bear out the statement here made that the sea lion does "not maintain any regular system and method in preparing for and attending to its harem." It would seem to have quite as definitely a marked round of domestic economy as the fur seal, and the same jealous exclusion of nonbreeding males is maintained.

Page 169: Such notes as seem pertinent in connection with the synopsis of Lieutenant Maynard's report here given will be reserved for the present and given in connection with the full text, which appears later in this volume.

Page 291: Lieutenant Maynard has confused and incorrectly stated many facts which Mr. Elliott has correctly given. There is probably no valid ground whatever for the supposition that the female fur seal ever gives birth to more than a single pup in a season. It is not true that the yearling males and females associate together to any extent on the hauling grounds. They probably come to the islands at different times. The females come latest, and doubtless spend their time for the most part in the water, more rarely on the rookeries, playing with the pups of the year. The pups begin to learn to swim in August instead of September and October. By the 1st of September they are all good swimmers. The killing of the pups by the surf is a tradition on the islands arising from a misunderstanding of the phenomenon of dead pups seen on the sand beaches after heavy gales, when the dead bodies of pups from the neighboring breeding grounds are washed off by the surf and deposited on the sand. The close observations of the seasons of 1896 and 1897 showed that few, if any, pups were killed in this way, while it was as clearly demonstrated that the pups, after learning to swim, are able to care for themselves in any kind of a sea. It is not true that the pups and cows remain until all other animals have left the islands. The pups and cows, as a class, leave first, in the early part of November, unless the weather is unusually favorable. The old bulls and bachelors remain later, the latter often continuing through December and into January. In mild winters some have been known to remain about the vicinity of the islands throughout the season.

Page 292: While it is true that at birth the covering of the pup is chiefly black hair, there is still the beginning of a coat of fur which, by the middle of September, has grown to be about as long in proportion as in the adult. The black hair is gradually replaced by a coat of gray, which deepens in color, and when the pup leaves the islands in November it has its full coat of fur, which is not easily distinguished from that of its yearling brother.

Lieutenant Maynard here accepts the estimate of Mr. Elliott for the breeding seals and their young, but differs from him in his estimate of the nonbreeding seals, finding as his total for all classes of seals "not far from 6,000,000." Mr. Elliott's estimate was 4,700,000. This difference between the two observers shows clearly that but little definite value can be attached to either estimate.

Page 295: Lieutenant Maynard here states what is the fact, that at the outset St. George Island was considered capable of yielding one-

third as many seals as St. Paul, and the apportionment of the quota between the two islands was made on this basis. This was changed in 1876 to one-ninth, but was presently raised to one-fourth and finally lowered to one-fifth, where it remained. Lieutenant Maynard intimates that the change to one-ninth was made because of the results of Mr. Elliott's estimates. As, however, Mr. Elliott placed the number of seals on St. George at one-eighteenth that on St. Paul, while the proportion of the quota for St. George was left at one-ninth, this does not seem to be consistent. The fact that the hauling grounds of St. George continued to yield from one-fifth to one-fourth of the quota of killable seals is sufficient proof, if there was no other, to condemn Mr. Elliott's estimates. This relation of the quota is borne out by the proportion of seals found by us during the past season, which gave one-fifth as many seals to St. George as to St. Paul.

ELLIOTT'S 1890 REPORT.

While we have taken exception in the preceding pages to Mr. Elliott's numerical estimates, it has been a pleasure for us to put on record our appreciation of the general excellence of his vivid portrayal of the life history of the fur seal. It is, however, a matter of great regret to us that we can not express a similarly favorable opinion regarding any considerable part of his work in the report of 1890.

In this year Mr. Elliott was assigned the duty of investigating the condition of the fur-seal herd. The agents in charge of the islands had become suddenly aware of a great falling off in the number of killable seals and were appalled by it. The primary cause of this reduction was plainly to be sought in the condition of the breeding herd. Since 1883 pelagic sealing had been going on on a large scale, involving a heavy destruction of females. This loss was added to the great natural losses to the young, which had kept the rookeries at a virtual equilibrium from 1875 to 1883, the deaths each year during this period from natural causes being about equivalent to the gains. Beginning with the increase in the pelagic catch from and after the year 1883, the loss of breeding females entailed by pelagic sealing constantly exceeded the annual increment, a steadily diminishing birth rate resulted, and, beginning with 1884 and thereafter, a growing difficulty was felt in filling the annual quota.

This difficulty was at first overcome by closer killing and afterwards by the taking of younger seals, thus causing a secondary but more conspicuous shrinkage in the bachelor herd, due to the anticipation each year, to a certain extent, of the quota of the year following, until in the last year of the lease of the Alaska Commercial Company (1889) it was necessary to kill every average sized 2-year-old to secure the full quota of 100,000. The new company in 1890 had to pursue the same policy of "robbing the cradle and the grave" in attempting to secure its assigned quota of 60,000 skins, of which it was only able to get 21,000.

In his investigations of 1890 this visible fact of close killing impressed Mr. Elliott, and was assumed by him to be the primary cause of the reduction of the herd instead of a commercial incident arising from it. To this impression he added the theory that the drives themselves were a source of injury, impairing the virility of the males, an hypothesis without a single fact to sustain it.

In accordance with these assumptions he proposed, as a remedy for the threatened destruction of the herd, the prohibition of the killing of males for a term of seven years, ranking it with the killing of females

as a destructive influence on the herd. This remedy would necessarily have involved the dispossession of the new lessees of the islands—the North American Commercial Company. To the real cause of the destruction of the herd he gave scant attention, overshadowing it by what seemed to him the more important cause—land killing.

After considering all the evidence in the case, the present writers are forced to believe that land killing, whether close or not, has not been a factor in the decline of the herd; that every year since the islands came into the possession of the United States an adequate supply of virile male life has existed on the breeding grounds; that the drives, whether long or short, careful or reckless, have not tended to impair the virility of the males which survive them; that the sole cause of the decline has been the destruction of females involved in pelagic sealing, the supposed inadequacy of this cause to account for the decline being due wholly to exaggerated estimates of the decline based not upon the condition of the breeding herd, but upon the depleted hauling grounds.

The theories and suppositions of Mr. Elliott need not be further discussed here and will be but briefly treated in the subsequent notes, as a fuller discussion of them will appear in the forthcoming final report of the commission of investigation for the seasons of 1896 and 1897.

Page 317: The reference here made to certain hauling grounds, as Zapadni (Southwest Bay) and Polovina (Half-Way Point) is reiterated again and again throughout the report. That these hauling grounds as well as all others of importance were regularly driven from is clearly shown by reference to the table of daily killings published in Murray's Report for 1894, Volume II, page 258, of this series. That the seals killed in the early years were largely from Zoltoi, Lukanin, and Tolstoi is true, and the reason is obvious. When the breeding rookeries were in their prime, as Mr. Elliott's own report for 1872 shows, the shore line of Reef Peninsula was so closely occupied by the breeding seals that the bachelors could not haul out at any point except on the sands of Zoltoi, which therefore became the hauling ground for practically all the bachelors belonging to the two great rookeries of Reef and Garbotch. In like manner the upper shores of English and Southwest bays were lined so closely with the breeding seals of Tolstoi and Zapadni that the vacant sands at the foot of English Bay became the general hauling ground for all the bachelors of these rookeries. The same is true of the hauling ground back of Lukanin Beach. It was a common one for both Lukanin and Kitovi. The same is true of the peninsula of Northeast Point. The seals could only haul at the end of the rookery, and of necessity were only found, as Mr. Elliott says, on "the sand reach between the foot of Cross Hill and the Big Lake sand dunes."

When Mr. Elliott visited these rookeries in 1890 they had become broken and depleted under pelagic sealing. The beaches were no longer closely packed with breeding seals. As he tells us, there were seven hauling grounds at Northeast Point at as many breaks in the line of harems. This was also true of Reef rookery and all the others, as it is to-day. Through the breaks in Reef rookery the bachelors for the most part then hauled out to the parade ground of the peninsula, having gradually abandoned Zoltoi. In like manner the bachelors of English Bay were distributed at various points around and back of Tolstoi and Zapadni rookeries. This distribution of the bachelors, as Mr. Elliott elsewhere remarks, began about 1882. At this time pelagic sealing had broken the equilibrium, and under its increase the herd had begun to thin out upon its breeding grounds.

Page 318: The charge of "overdriving," here put forward as the cause of the decrease in the fur seal, is wholly without foundation. The following statistics regarding the taking of seals on land are pertinent:

Statistics regarding land and sea killing, 1871–1890.

Year.	Date quota filled.	Hauling grounds driven.	Number of drives.	Killed on land. *a*	Killed at sea.
1871	July 28	46	43	102,960	16,911
1872	25	43	30	108,819	5,336
1873	24	51	37	109,177	5,229
1874	17	61	41	110,585	5,873
1875	16	55	37	106,460	5,033
1876	Aug. 1*b*	36	30	94,657	5,515
1877	July 14	44	32	84,310	5,210
1878	18	54	35	109,323	5,544
1879	16	71	36	110,411	8,557
1880	17	78	38	105,718	8,418
1881	20	99	34	105,063	10,382
1882	20	86	36	99,812	15,551
1883	19	81	39	79,509	16,557
1884	21	101	42	105,434	16,971
1885	27	106	63	105,024	23,040
1886	26	117	74	104,521	28,494
1887	24	101	66	105,760	30,628
1888	27	102	73	103,304	26,189
1889	31	110	74	102,617	29,858
1890	20*c*	87	55	28,059	40,814

a Contains all males, including pups, killed for any purpose.
b Season said to be late.
c Closed by order of Treasury agent.

From this table it will be seen that nothing abnormal occurred in the driving of the seals. It was not until 1884, when pelagic sealing had trebled its catch and was in its most destructive stage, that any marked increase in the driving began. This trebling of the catch in 1882 so affected the birthrate of that season that in 1885 it was difficult to get the required number of skins, and the drives were increased from 42, or a preceding average of 36, to 63. Subsequent to this date the number of drives increased steadily, and the date at which the quota was filled as steadily receded. The reason for this growing scarcity of killable seals, as evidenced by difficulty in securing them on the hauling grounds, is to be found in the rapid increase of the pelagic catch with and after 1885. That there was no diminution in the actual number of animals taken is due to the fact that smaller and smaller seals were killed until, all the normal 3-year olds being exhausted, 2-year olds and finally yearlings were taken. The increase in the number of hauling grounds driven, from and after 1879 may show the effects of the slight increase in the pelagic catch in that year, or it may mean simply the shifting of the bachelors and their more general distribution among the rookeries.

These figures show plainly enough that there is no truth in the theory of increased driving, and it is equally clear from the recorded pelagic catch that the second cause of inquiry, here barely mentioned by Mr. Elliott, is an efficient cause of the decline in the herd.

Page 319: The falsity of the statement here reiterated, of the sending of sealing gangs "miles and miles away to hitherto undisturbed fields," is amply refuted by the recorded daily killings already mentioned. Mr. Elliott goes on to say that he was now able to "see what the effect of driving overland is upon the physical well-being of a normal fur seal." From this he draws certain conclusions regarding the lack of adaptation to "land locomotion over rough, sharp rocks, rolling clinker

stones," etc., the "prolonged, unusual, unnatural, and violent effort," the effect of which "must leave a lasting mark upon the physical condition of every seal thus driven and then suffered to escape from the clubbed pods on the killing ground." It is worthy of note in connection with this that in the Russian times, up to the date of the transfer of the islands to the United States, all animals were driven to the village killing grounds, this involving a distance of 12 miles for the Northeast Point seals, and 5 and 6 miles, respectively, for the seals from Polovina and Zapadni. Notwithstanding this treatment the seals flourished, and in 1872 Mr. Elliott found them in excellent condition. Under the American régime, against which he brings the charge of injurious overdriving, we find that salt houses were established at Northeast Point, Stony Point, and Zapadni, reducing the longest drives to a minimum of less than 3 miles. In support of this we may cite Mr. Elliott himself on page 406 of this very report: "On St. Paul, at Northeast Point, a regular salt house and killing ground has been ordered and maintained by our people ever since 1868. * * * Also, * * * a small killing ground has been established at Stony Point, or Tonkie Mees, ever since 1879. * * * Another killing ground at Zapadni, St. Paul, close by Antone's House, has been used ever since 1879." He also notes that a salt house was established in 1868 on St. George, at Zapadni, which removed the necessity of driving the seals from this rookery across the difficult and rocky trail of 5 miles to the village killing grounds, which was the regular thing throughout Russian times. It is against a management which had reduced the difficulties and hardships of driving to a minimum that he brings the charge of "overdriving," a charge which is utterly groundless.

Page 320: Mr. Elliott here asserts that the injuries sustained by the driven seals are such as to "work physical disability or death thereafter to nearly every seal thus released, and certain injury to its virility and courage." The seals released were certainly either those too young to kill or too old. The former made up the quota of subsequent years, and as this quota did not fail we may infer they did not die. That bachelors appeared each year to be driven and redriven proves clearly enough that the birthrate was maintained and that a sufficient number of the older ones must have escaped to replenish the stock of bulls upon the rookeries.

The opening sentence of the note to this page shows clearly enough the inconsistency of Mr. Elliott's position. The animals, as he says, "have a power of resistance to shocks which would certainly kill any other animal." That an animal which can buffet the storms of winter in the North Pacific and Bering Sea through months of continuous travel should succumb, or receive permanent injury from a few hours of land travel, is absurd in the last degree. The fur seal, though clumsy and unused to it, is perfectly well adapted to land travel. Its discomfort arises from the effects of overheating, due to its thick coat of blubber and fur. If care is not used in driving, the seals will die of exhaustion. If they survive, it may be inferred that no real injury has been sustained.

Page 321: The dissatisfaction here expressed by Mr. Elliott over the failure of pelagic sealing to satisfactorily account for the reduction of the herd must have arisen from one of two causes: (1) A failure to appreciate the full effect of the pelagic catch, which had averaged for five years about 30,000 animals actually secured, of which Mr. Elliott himself says 85 per cent were breeding females; or (2) a desire to find some more congenial reason. While this discussion was going on in

Mr. Elliott's mind, the supposed reduction seemed by no means as great as it actually was, because it was based solely upon the advice of the agent in charge of the islands that the quota be reduced from 100,000 to 60,000. This turmoil of mind experienced by Mr. Elliott before reaching the islands, which left him "very much confused in thought as to what he should observe," indicates that he entered upon his work with preconceived theories; and the subsequent record of his investigations shows that instead of seeking the facts he merely sought material to support his theories.

Page 328: The contrast here drawn between the state of the Pribilof herd and the herds of the Antarctic is utterly unwarranted. In the Antarctic the rookeries were destroyed by the indiscriminate killing of males and females, old and young, on their breeding grounds. The sealing which destroyed them was exactly the indiscriminate slaughter involved in pelagic sealing. On the islands superfluous males only were killed. Mr. Elliott does not dare to assert that females were killed, but he implies it in this unwarranted comparison.

Page 329: As we have already shown, in connection with Mr. Elliott's report of 1872, the surveys on which his estimates at that time were made have no value, if they had any existence. The figures built upon them are gross exaggerations, and the careless use of them leads one to believe that their author had no sense of their meaning or value. What has been said of the 1872 surveys and estimates applies with equal force to those for 1890, which, as he tells us, are "made in precisely the same time and method."

For his estimate of 1890 Mr. Elliott arbitrarily compressed the breeding areas to one-fourth their former extent, and found a decrease of one-fourth in the breeding seals and young on St. Paul, one-half on St. George. Having done this, he ignores entirely, for the rest of his investigation, the breeding seals, and confines his attention to the bachelors.

Of course, the estimate of "750,000 square feet" of area for Lagoon rookery is a slip of the pen for 75,000, but the increase of the length of this rookery, without comment, to 1,500 feet, as against 750 in 1872, is apparently intentional and not easy to understand. On St. George, where he has made similar extensions of breeding shore front, he explains the necessity by charging it to excessive driving in the vicinity of the breeding grounds, a matter which will be discussed again in its proper connection. As no drives were ever made from Lagoon rookery, this reason was not available there, and so no explanation is offered. The same may be said of the increase of 300 feet in the length of Reef rookery. As all the sea front is occupied now, and was presumably fully occupied in 1872, it is difficult to see how it could have been later extended.

Page 330: The figures here given for St. George are still less satisfactory. We find in every instance that the sea margin of this island, the breeding area of which Mr. Elliott contended in 1872 was limited by the character of the ground, is largely increased. In the case of Zapadni it is more than doubled, while in the case of East rookery it has increased from 900 to 3,240 feet. As already noted, by these figures there is shown a reduction in the sixteen years to about one-fourth in the seals on St. Paul, while on St. George the reduction has been only to one-half. This discrepancy Mr. Elliott does not notice, much less explain. In 1872 the relation between the seals of the two islands was 1 on St. George to 19 on St. Paul. In 1890 it is about 1 to 10. During all this time the ratio of killable seals between the two islands, as

shown by the quota, has been about 1 to 5. But Mr. Elliott probably never took these figures seriously or studied their meaning. The more one examines them the worse they appear. The census was the most important piece of work Mr. Elliott had to do, and it is worthless.

Page 331: The explanation here quoted of the method of enumeration followed in 1872–1874 has already been treated in its proper connection, and need not here be mentioned.

Page 335: The impression is given in the description of this diagram that this 100 square feet of breeding area was actually staked out and measured. It may have been so measured, but, in our estimation and from our experience in numerous attempts to locate breeding areas for measurement, it was impossible to have made the measurements with the animals on the ground; and if the boundaries were merely noted then and measured after the lapse of months, such measurement would be merely guesswork, and it does not deserve the importance here attached to it.

Page 336: The two statements of fact here laid down by Mr. Elliott as a guide to the proper understanding of his argument stand sorely in need of correction. In the first place, the "nubiles" (2-year-old cows) for which allowance is made were not and are not to be found upon the rookeries in the breeding season, nor until about August 1. In the second place, the proportion of females to males here given makes no allowance for absentees, and consequently the number must be doubled. Further, in his statements of fact we find that "a newly born (2-weeks(?)" old pup is 14 inches in length and weighs from 10 to 11 pounds. In the next breath he tells us that the pup from 1 to 3 weeks old is "a scant foot" in length. And all this occurs after he has told us, in his 1872–1874 report, in one place that the newly born pup is 3 to 4 pounds weight; in another, 5 to 7½, and in still another, 6 to 7½. Furthermore, he here tells us that "no fur seal, old or young, when resting on the breeding grounds, stretches itself out at full length on the rocks or earth unless injured in the lumbar regions." As a matter of fact, the stretching out at full length is a favorite position for healthy animals. Probably the whole difficulty with this labored explanation of Mr. Elliott's method of computing the seals of 1872–1874 lies in the fact that it was not published until 1891 and, doubtless, not written until 1890 or 1891.

Page 345: We have already referred to the shore extension of Lagoon rookery and the absence of any explanation regarding it. Though the rookery, according to Mr. Elliott, has extended itself to double its original length, this is compensated for by a reduction of the width to 12 feet from 100. In this way a reduction from 37,000 seals in 1872 to 9,000 in 1890 is obtained for this rookery.

Page 346: In connection with Mr. Elliott's discussion of Lukanin and Kitovi rookeries in his 1872–1874 report we have called attention to the strong evidence of the grossly exaggerated character of the original estimates. We may again examine those of 1890. We have for these two rookeries in this year a total of 100,000 "breeding seals and young." He calls these rookeries the "worst wrecks on the islands," because there were three and one-half times more seals there in 1872 than in 1890, overlooking the fact that his total figures for St. Paul show a reduction for the whole island to one-fourth the population in 1872. The total population of Lukanin and Kitovi rookeries for 1897 was less than 20,000, a reduction since 1890, assuming Mr. Elliott's figures, to one-fifth. We do not believe such a reduction has occurred, but these considerations show the gross exaggeration of Mr. Elliott's two estimates.

Page 353: The fact here stated that "172 old breeding bulls" had

been "scraped up" on the rookery margins by the native drivers, while put to another use by Mr. Elliott, should be borne in mind when considering the value of the contention that the rookeries were in 1890 deficient in male life for breeding purposes. One who has seen the herd of idle bulls during the past two seasons lying among the bachelors or between the bachelors and the cows on this rookery, can easily understand that in 1890, as at the present time, there was a surplus of idle bulls which could not get harems on account of the dearth of cows.

Page 354: We have already shown the falsity of this statement here repeated that "since that time (1857 or 1872) up to 1882, beyond a few small drives made early in June for food, no seals in considerable numbers had been drawn from the hauling grounds of Polovina," etc. It is worth while to cite a few figures from the record of killings (Murray's report, 1894, Vol. II, p. 258). The following is the record for Polovina:

1876	811	1879	3,650
1877	2,849	1880	4,968
1878	3,710	1881	a 2,131

Like results are found on investigating Zapadni, or Southwest Bay, as it was called in the early days. Southwest Point here and elsewhere mentioned was never a breeding ground and only a temporary overflow hauling ground. It is still the favorite hauling ground of young half bulls. The reference here to Southwest Point is plainly for the purpose of misleading, as in the whole period of twenty years only two drives had been made from this hauling ground. These occurred in 1886.

Page 357: The close inspection of Sea Lion Rock during the seasons of 1896 and 1897 gives no reason for supposing that it has not always been a breeding ground for the seals. The statements regarding its exposed condition and the wisdom of the seals in avoiding it are abundantly disproved by the fact that they breed there now, the rookery being in fact nearly as large as Lagoon. The islet is not unduly exposed and is protected from the north and westerly storms by Reef Peninsula itself. The truth probably is that Mr. Elliott failed to inspect the rookery in 1872. There is no evidence that he visited it in 1890. It is not necessary to suppose any more difficult reason for the occupation of this rock as a breeding ground than the fact of its suitability for such purposes and its proximity to Reef rookery.

Page 359: Mr. Elliott here says that "the scantiness of the St. George rookeries is due to the configuration of the island itself." This may be true, but it does not accord well with Mr. Elliott's statements that when the rookeries were teeming with seals in 1872–1874 they only covered one-half the shore space they occupied in 1890, after being reduced one-half.

Page 361: Mr. Elliott attempts to account for this absurd increase in the shore extension of the St. George rookeries by the theory that it "is due to that rough driving of the sealing gangs along the rookery margins during the last six or seven years. This scraping has the decided effect of forcing the outside harems lying farthest back from the water," etc. He continues to draw a picture of the evil effects of this supposed result of an imagined cause by saying that when storms prevail "thousands and tens of thousands of pups within the reach of the surf are destroyed." This is a fair specimen of Mr. Elliott's generalizations. By his own figures Zapadni rookery had in 1890 only 12,500 "bulls, cows, and pups."

a Two other drives were made in this year, but were combined with seals from Lukanin, and the proportion can not be determined.

Page 362: In a note to this page Mr. Elliott gives a table of drives for the year 1872 from the rookeries of St. George. In view of what he has just said of the severity of the drives in causing the spreading out of Zapadni and East rookeries, we may extend this table for a few years subsequent to 1882, when he says the terrific driving that has done such mischief began, and see what the result will be:

Number of drives, St. George Island.

Hauling ground.	1872.	1882.	1883.	1884.
Zapadni	11	None.	4	10
Staraya Artel	14	17	15	10
North	16	15	11	9
East	16	19	18	11

If we carry on the record of Zapadni, we find the following result: 1885, 6 drives; 1886, 7; 1887, 6, etc. Nothing more conclusive of the utter folly of the theory of the scraping of the rookeries in these years could be needed. No abnormal increase in the number of the drives occurred in 1882, and in subsequent years they steadily diminished. The reduced condition of the rookery made it not worth while to make drives.

Page 366: It is only necessary to refer to the preceding note on Zapadni rookery to appreciate the untruthfulness—one might almost say malice—of this theory of the "raking and dinning" of the hauling grounds. Any reasonable observer should have been staggered at finding in 1890 3,275 feet of rookery front for a rookery, where in 1872-1874, when it was nearly three times as large, according to his own figures, it had only 900 feet of shore front. But to Mr. Elliott the figures were infallible, if not reasonable. If we complete the record of drives for East rookery, begun in the preceding note, we find that in 1885 there were but 6 drives; in 1886, 8, and in 1887, 9.

Page 370: The supposition that there are natural enemies which depend upon the fur seal for subsistence and whose ravages on the herd increase in proportion as it diminishes has no basis in knowledge. The sharks Mr. Elliott mentions do not kill fur seals or any other large animals. The Great Killer devours a large number of pups about the islands, apparently visiting them in the spring and in the fall on its periods of migration, but there is no evidence that its hunting of the fur seals is more than an incident. It certainly does not depend upon them for food. The only important natural enemies of the young fur seals are the storms of winter and possibly starvation due to lack of success in getting food. These causes act only in proportion to the size of the herd. No reference is made here to the natural causes of death through *Uncinaria* and trampling, of which Mr. Elliott knew nothing.

Page 371: The purely imaginative estimate here given of the amount of food eaten by the fur seals has no value. It has already been discussed in the earlier report of 1872-1874, from which it is here quoted.

It is difficult to treat with patience such a statement as the one here made—that "those (males) spared from the club annually during the past twenty years were rendered useless for rookery service from the immediate or subsequent effect of severe overland driving whenever they lived through it." It is impossible to harmonize such a statement with the known fact that hauling grounds continued to yield 100,000 males each year during this period and remained properly stocked with

breeding bulls. Mr. Elliott, in his report of 1872–1874, reached one valid conclusion, namely, "that no danger of the slightest appreciable degree of injury to the interests of the Government on the seal islands of Alaska exists so long as the present law protecting it and the management executing it continues." This is the only conclusion of his earlier work which he calls in question, and to its undoing his whole report of 1890 is devoted. It is, however, perfectly correct.

Page 376: It is worth while analyzing the prediction here made that the Pribilof rookeries will be in "still worse condition in 1891" and "for four or five years longer;" that, in fact, it will "take seven years for the fresh young blood to mature and come upon the rookeries" to hold the "demoralized and diminished herds in check on their downward grade." His claim is that the male life already on the rookeries is, for purposes of "reproduction, quite lifeless, almost impotent, wholly so in the aggregate of cases," and as a result it must be recruited from the birthrate of pups. His plan of doing this is to suspend all killing of males for a period of seven years. According to his own calculation, Mr. Elliott finds 12,500 bulls on the rookeries of the two islands for about 400,000 cows, an outside estimate. This is practically the proportion which now exists between the sexes, when there are double the number of adult bulls struggling for places on the breeding grounds that can secure harems. According to Mr. Elliott's own estimates, of the 400,000 pups born in 1890, one-half, or 200,000, return as yearlings, and three-fourths of the yearlings survive to the age of 3 years, while the losses after that age are insignificant. Of the 150,000 animals thus surviving to the third year, one-half, or 75,000, would be males, five times the number needed for the herd of breeding cows in 1890, and he would have this number multiplied by 7, producing more than 500,000 bulls, the avowed purpose of this overstocking of the rookeries being their preservation. Such a horde of fighting bulls would endanger the existence of the rookeries.

Page 381: Mr. Elliott gives us here, in parentheses, his estimate of bulls for 1890, without details as to how it was obtained. The total is 12,500. We may infer that it was an estimate, and in the frame of mind in which his investigations have been carried out it must be taken as a minimum. There are, then, 12,500 bulls for 400,000 cows; 1 bull to about 33 cows, or just the proportion which holds good on the rookeries to-day, when only one-half of the able-bodied adult bulls can obtain harems. It is true that Mr. Elliott charges that these bulls are impotent and worthless. The history of subsequent years shows plainly enough that this was not true. The condition of the rookeries in 1896 and 1897 shows that no dangerous disproportion between males and females existed in 1890, while the investigations of the past three seasons on south rookery of Bering Island show that 200 cows to 1 bull is by no means an impossible relation.

In the summary of explanations here given (1) may be passed by as answered in the note above. If Mr. Elliott found an average of 15 cows to a bull in 1872, making the necessary allowance for absent females, which he did not make, the real average was 30. The present average is the same. (2) The reputed harem of "50 to even 100 females" here given is at variance with Mr. Elliott's own figures, which are 12,500 bulls to about 400,000 cows, an average of about 33. (3) This statement is amply refuted by the record in the tabulated killings, as given by Mr. Elliott in his field notes (p. 481 and following). Not all the killings are dealt with, but in those recorded we find 1,175 half bulls rejected. As this class of animals hang about the rear of the rookeries

in larger numbers than on the hauling grounds, this does not represent a tithe of the reserve of young males present in 1890. Double the number here recorded would be ample. (4) This statement has absolutely no point. (5) The coupling of land with sea killing, as a cause of decline, is a logical outcome of this report. It is, however, a falsehood pure and simple to assert that land killing had anything to do with the decline. Sea killing, and this alone, in its killing of gravid and nursing females with the consequent destruction of their offspring, has brought about the depleted condition of the herd.

Page 389: There is one large class of statements in this report which are of the nature of deliberate misrepresentations made for effect and which can not be fully treated without going into too great detail. One example will suffice to show the nature of many of these statements which have been passed over in silence. Mr. Elliott here says: "As for Little Eastern, not a single drive has been made from there this year. At no time was there more than 12 to 15 holluschickie upon its grassy borders last July and August." By reference to the table of daily killings (Vol. II, Murray, p. 258, x), already many times alluded to, we find that in the whole time since the islands came into the possession of the United States not a single drive is recorded from this rookery except in the years 1883 and 1884, when three times each bachelors from this little rookery were included in drives from East rookery. The bachelors from Little East rookery naturally haul up with those from East rookery in accordance with the instinct of the fur seal to go where the crowd is.

Page 390: Another example of what can not be considered as other than willful misrepresentation is found in this record of field notes for Zoltoi. On the very 19th of July when he says that there is "not a single holluschickie on Zoltoi sands" and "not one has hauled there thus far this season," his own record of the killings for the year given on page 533 of this report shows that a drive was made from this hauling ground that very day, and that a previous drive was made on June 24. Further comment is not necessary.

Page 392: Mr. Elliott here records, under date of July 18, that of a drive of 1,192 seals, 115 were "all over six years," besides a certain number of "bitten 4-year-olds and a few 5-year-old wigs." It is true that these are called "somnolent, apathetic, worthless bulls," but this is merely a matter of opinion. The fact remains that they were bulls of breeding age and that they were superfluous or they would not have been in the drive. That Polovina rookery was fringed with idle bulls in 1890 as at the present time is abundantly shown by this and by Mr. Elliott's earlier statement, under date of June 25, that a large number of unoccupied bulls were sleeping on the sands of Polovina.

Page 396: The picture here drawn of the terrible effect of driving on the cows is very forcible and graphic. The only objection to it is that cows were never driven. It, therefore, has no relevancy. The description given of the way in which the bachelors were watched for and hustled off to the killing field before they had "become even acquainted with terra firma" is not warranted by the facts. By reference to the recorded killings given on page 532 of this report we find, for example, that Reef rookery was driven on the 6th of June; it rested until the 11th; was driven again on the 16th; again on the 20th; still again on the 24th, on the 28th, and on July 1, 5, 10, 14, and 19. If we contrast this sort of driving with that of 1873, for example, we find Reef driven on June 3, 6, 11, 16, 26, etc.; in 1874 it was driven on June 3, 8, 11, 15, 26, etc. Wherever any statement made by Mr. Elliott is tried by the

records it is found wanting. There was no feverish haste and undue increase of the driving in 1890. As a matter of fact the amount of driving done is, and has been, largely regulated by the ability of the men to handle the work.

Page 407: We hesitate to call attention to the statement of the weight of the fur-seal pup again. But this matter is a fair sample of the way in which Mr. Elliott handles his facts and figures. Here the pup is 6 to 7½ pounds in weight, and 12 to 14 inches long. On page 336 of this report the weight is given at 10 to 11 pounds. The remark here made that a single male and female of this class was handled, explains the inadequacy of Mr. Elliott's ideal of the fur-seal pup at birth, but does not excuse it.

Page 458: Mr. Elliott here asks again a question he has many times raised: "Where is the new blood which must take the place of the old and enfeebled sires before us, already failing to meet the demands of the hour on every side and ahead of us?" We may refer Mr. Elliott to his own figures, to be found in his field notes (p. 481 and following), where he records the turning back of 1,175 young half bulls. He tells us that it was not thought worth while to drive off the bachelors from Zapadni Head, Otter Island, and Sea Lion Rock in 1890, as had been done in 1889. As these places are the favorite haunts of the half bulls, and as they are to be found in every angle and turn of the breeding grounds, we may infer that there was no scarcity of them. That the rookeries to-day contain fully 10,000 able-bodied bulls at least 7 years of age, is conclusive proof of the matter.

Page 481: At the foot of this page we have the beginning of a series of tabulations, already referred to, showing in detail the number of pods handled on the killing ground, the animals killed, and the rejected half bulls. The footing up of the number of half bulls rejected gives a total of 1,175, and only a part of the drives of the season are recorded.

Page 482: It is difficult after reading the paragraph on this page, of which the following sentence is the beginning, without wondering what Mr. Elliott has been talking about in his bitter arraignment of the process of driving:

"I should remark that the driving of the seals has been very carefully done, no extra rushing and smothering of the herd, as was frequently done in 1872." One instinctively contrasts this with the statement made on page 484: "Even if they do manage to endure (some of them, not many) all of this intense physical suffering, exhaustion, straining of tendons, congestions of lungs and brains, and heart suffusions," etc. The contrast which Mr. Elliott has drawn between the driving of 1890 and 1872 shows two things very clearly: first, that in his 1890 report, except in this instance, he has grossly misrepresented the kind of driving done, and second, that in his 1872 report he intentionally suppressed damaging evidence against the methods of driving then employed. We are inclined to believe, however, that the "dropping of exhausted seals along the road in 1872–1874" is an exaggeration of such accidents as must occur in the handling of the drives when the weather becomes suddenly unfavorable. Such accidents have always occurred and must occur. But they are few.

Page 483: In view of the repeated claims of dearth of young bulls and breeding bulls we can not refrain from again calling attention to Mr. Elliott's own refutation of this claim. Here he states that "an enormous number of 5 and 6 year old bulls were in it (the drive) for the whole number driven." Again a "large number of somnolent, apathetic bulls" are stretched out on Polovina sands. They were

doubtless truly sleeping and apathetic bulls. They had probably fought for a place on the breeding grounds, and finding that their chances of getting harems were scanty, they had withdrawn to the sand beaches and were taking life easy. Mr. Elliott repeatedly asserts that these bulls were impotent and invirile, but as he records no dissections or other examinations designed to show this we are not under obligation to accept the mere statement. In like manner the terrible effects charged against driving are not substantiated by a single dissection, the only means of demonstrating such effects.

In this connection it is worthy of note that Mr. Elliott is surprised at the failure of his own theory that the driving killed practically every seal driven and rejected. He is watching the released seals return to the water from the killing ground and says: "To my surprise most of these seals headed directly back for Polovina, jumping in rapid dolphin leaps and swimming rapidly." Again he recounts how he "saw three released seals sporting in the village lake. * * * They seemed to be perfectly happy," etc. The following day he found a seal dead on the shore of the lagoon. He remarks that the seal had died "last night from the strain or effect of that drive overland from Tolstoi or English Bay." We have, however, no record of the autopsy by which this verdict was established, and this is the only dead seal which Mr. Elliott has cited to support his theory of the great evil effects of overdriving.

Pages 492, 493: On these and subsequent pages Mr. Elliott has given a set of statistics regarding the drives, which show plainly a fact that he evidently overlooked—namely, that the great deficiency in bachelors was confined to those of killable age. He states that of 4,001 animals driven, 92 per cent were turned away; of 4,323 driven, 90½ per cent were turned away; again, of 1,865 driven, 87 per cent rejected; of 1,929 driven, 88 per cent were rejected, etc. He notes that the bulk of those rejected were yearlings. The dearth of bachelors was therefore not due to deficiency in the birth rate of the previous year. Abundance of the yearlings answered for that. The deficiency in older bachelors is very simply explained by the known anticipation in 1889 of the quota of 1890 by killing its seals in advance Had there been no yearlings in 1890 Mr. Elliott's theory of "impotent" and "invirile" bulls might have had some foundation to rest upon, but it is made in the face of the plainest evidence against the theory.

Page 501: Here, again, under date of July 19, we have one of that class of statements which are all too common in this report, and for which there seems to be no excuse. Mr. Elliott states: "Not a single young male seal on Zoltoi sands this morning (4.30 a. m.); not one has hauled there thus far this season." By turning to page 533 of this report we find that a drive was made from Zoltoi that very morning, and that a previous drive had been made on the 24th of June.

Page 504: Mr. Elliott writes in his field notes, under date of August 9, as follows: "That southwest gale of the 30th and 31st of July, which I experienced and followed so closely on St. George, seems to have destroyed a great many pups over here on Garbotch sea margin. There are 17 dead pups lying half buried in the sands of Zoltoi right before and under my eyes." This is a fair example of the observations on which Mr. Elliott establishes his conclusions. This same phenomenon of dead pups was noted by us in 1896 and 1897. There were 33 bodies on Zoltoi in the former year. On Tolstoi sand beach 230 were counted and many others on the sand beaches of Northeast Point, Polovina and Zapadni. They appeared after the first unusually high surf. Inspec-

tion showed that they were rotten and had been long dead. The simple explanation of their presence on the sand beaches was that the surf had washed them from the neighboring rookeries and deposited them there. This note, made the basis of an incorrect conclusion by Mr. Elliott is, however, important at the present time, because it shows that then, as now, there existed the same natural mortality among young pups, due to trampling and *Uncinaria*. Of this Mr. Elliott was not aware; and instead of seeking by examination to establish the cause of death he jumped at the conclusion that the surf had killed them.

CONCLUSION.

In concluding this examination of Mr. Elliott's report for 1890 we must again express our regret that it was ever written or printed. It adds absolutely no knowledge to the subject, while it is the source of needless error and confusion. It is wholly lacking both in the methods and spirit of scientific investigation. Mr. Elliott evidently entered upon his work with a preconceived theory, and bent his energies to the establishment of this theory. The theory—the injurious effects of driving upon the males—he tells us he substituted for the theory of the destruction of females by pelagic sealing, because he believed the latter to be inadequate to account for the decline in the herd.

The only reasonable place in which to seek for the cause of decline was the breeding herd itself. Mr. Elliott, in his investigations of 1890, except for repeating in a perfunctory manner his erroneous survey and estimate of 1872–1874, paid absolutely no attention to the breeding seals. He sought the cause of decline in the bachelor herd. He found the bachelors greatly reduced in number. He asserted that they were being driven to death, and that none were left to replenish the failing stock of breeding males. He asserted that those of the latter class to be found on the rookeries were impotent, their virility having been destroyed by previous driving.

His own figures and observations, however, show that these assertions were without foundation. He records a proportionately adequate rejection of half bulls from the killing fields. By his own estimates there was an adequate supply of bulls on the breeding grounds and a surplus of reserve male life which was not called upon. It is true that he holds this male life to be impotent and worthless, but there is not a single recorded dissection or examination to prove the assertion. Nor does he record a single dissection to substantiate the injurious effects of driving upon the young males which he so loudly denounces. But one instance of death from driving is recorded by him, and in the absence of any autopsy examination we are not bound to accept the cause of death assigned.

Mr. Elliott in 1890 reiterated all his mistakes of 1872–1874, without correcting a single one. He treated his earlier work as infallible, except in the one all-important generalization in which it was correct. He was in 1874 unable to locate the 2-year-old cows. There is no record of any renewal of the search for them, and they are again wrongly assigned to a period when they are not present at all. He again failed to appreciate the relation between the cows present at the height of the season and the actual number belonging to the herd; at the time when his census was made not more than half of them being present. He did not discover the presence of the destructive agency *Uncinaria* as a cause of the death of pups, though he records information which shows that it was at work before his eyes. He credited pelagic sealing with

the importance of a second place in the destruction of the herd, but made no investigation of its methods or results.

The most important piece of work which Mr. Elliott, or anyone else in studying the seals, has had to do is the making of a census of the breeding herd. That his estimate of 1872–1874 is inaccurate and more than twice too great finds some excuse in the magnitude of the problem then involved. But no such excuse exists for his work of 1890. The herd had been greatly reduced, and parts of it at least were within the reach of exact enumeration. Notwithstanding, his survey and estimate of 1890 are much less satisfactory than the earlier one.

Mr. Elliott in 1890 did, however, reconsider one conclusion reached in 1872–1874. He found at the latter date that no injurious effects resulted from the method of land killing. This was an important conclusion and absolutely true, but its withdrawal in 1890 was necessary to clear the way for his theory of overdriving and to further his purpose of securing the canceling of the agreement with the present lessees of the islands.

Two causes of decline are stated by Mr. Elliott—one of them, the injurious effects of land killing, is elaborated at great length; the other, the injurious effects of killing at sea, is barely mentioned. The first is wholly imaginary; the second valid, but made insignificant by his manner of treatment.

His proposed remedies follow the order of the causes to which they are to be applied. He would have land killing suspended for seven years and sea killing restricted. His plan would have provided for a supply of bulls fully one hundred times as great as necessary, first, and afterwards, for the restriction of the slaughter of the females they were to serve. The first part of the plan, wholly useless and unnecessary, it was within the power of the United States to carry out. The second part was at best a possibility, to be insured only by the cooperation of other nations.

It is not for us to say what were the motives which prompted such work. We believe, however, that we are justified in saying that its methods and results can not be too strongly condemned.

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